THE
RAILWAY GAZETTE

Price: Two Shillings

FRIDAY, MARCH 29, 1957

ENGINEERING

Annually £4-10s. by post

APR 24 1957

LIBRARY

Keeping trains moving

with

WESTINGHOUSE

O.C.S.

and

E.P.

Photographed by courtesy of British Railways—Scottish Region

The speed of operation attained by

WESTINGHOUSE

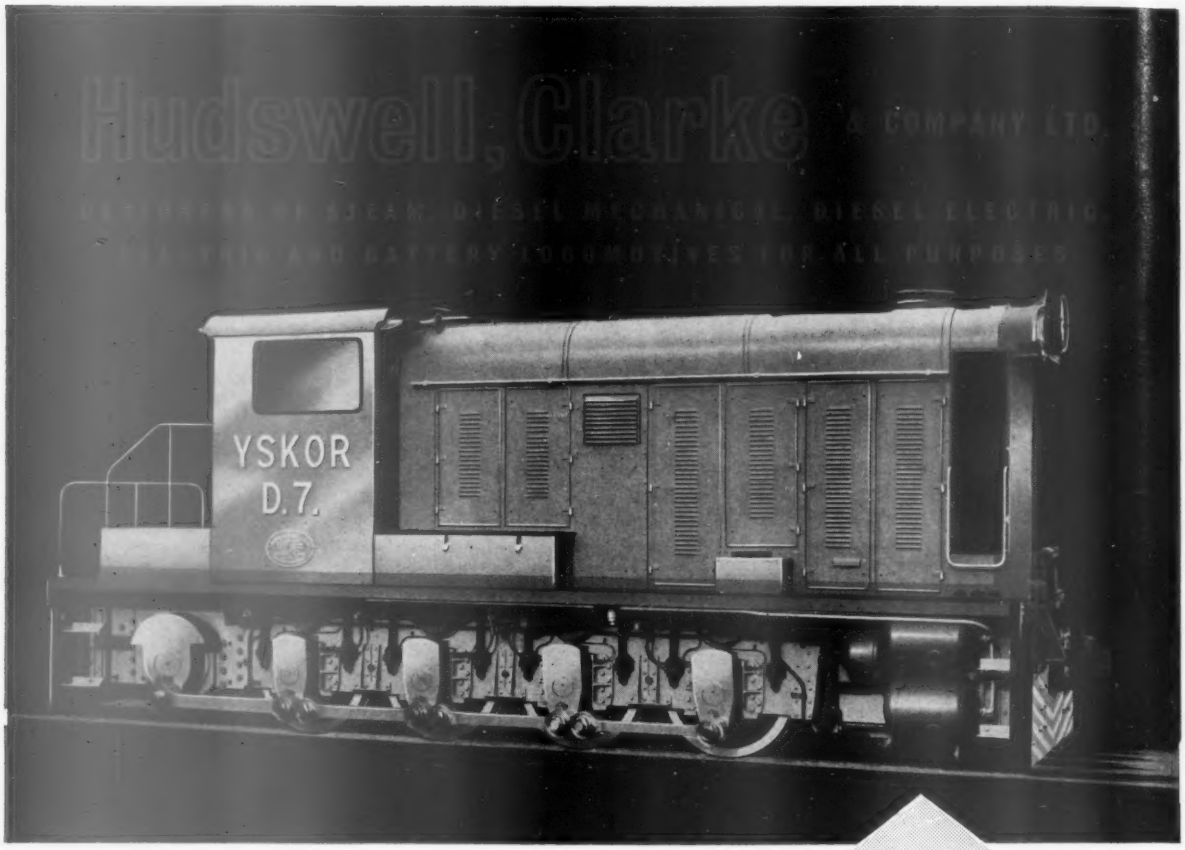
O.C.S. route relay interlocking coupled with E.P. point operation is unequalled by any other system.

This system is employed at the new installation at Cowlairs, Glasgow, where, from the panel illustrated, 227 routes are controlled.

Made in England by

WESTINGHOUSE BRAKE & SIGNAL CO. LTD.

82, YORK WAY, KING'S CROSS, LONDON, N.1



500 h.p. 0-8-0 diesel locomotive fitted with hydraulic coupling for South Africa.

ESTABLISHED 1860—PIONEERS IN THE USE OF HYDRAULIC COUPLINGS (1929) AND CONVERTERS (1931) FOR LOCOMOTIVES.

MANUFACTURERS OF THE CONSTANT HORSE POWER DUAL FLUIDRIVE LOCOMOTIVE FOR ALL DUTIES

HUDSWELL, CLARKE & CO LTD

PIONEERS FOR NEARLY 100 YEARS

RAILWAY FOUNDRY LEEDS 10

Telephone: Leeds 34771 (6 lines). Cables: Loco, Leeds.

LONDON OFFICE: 120/122 Victoria Street, S.W.1. Telephone: VICtoria 6786. Telegrams: Hudclar, Sowest, London. Cables: Hudclar, London

THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · THE RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · THE RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.
Telephone : WHitehall 9233 (12 lines) *Telegrams : "Trazette Parl. London"*
BRANCH OFFICES
GLASGOW: 87, Union Street . . . . . *Central 4646*
NEWCASTLE-ON-TYNE: 21, Mosley Street . . *Newcastle-on-Tyne 22239*
MANCHESTER: Century Insurance Building, St. Peter's Square *Central 3101*
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . *Edgbaston 2466*
LEEDS: 70, Albion Street . . . . . *Leeds 27174*
BRISTOL: 8, Upper Berkeley Place, Clifton . . . . . *Bristol 21930*
Annually £4 10s. by post. Single copies, Two shillings.
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.
Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 106] FRIDAY, MARCH 29, 1957 [No. 13

CONTENTS

	PAGE
Editorial Notes	353
Railway Wage Settlement	355
Work Study on British Railways	355
Locating Subsidence Slip Planes	356
C.I.E. in 1955-56	357
Railway Communication Systems	357
Letters to the Editor	358
The Scrap Heap	359
Overseas Railway Affairs	360
Railway Operating Factors	362
Experiments with Points and Crossings	363
Use of Sand and Gravel by British Railways	364
New Carriage and Wagon School at Derby	367
Personal	369
New Equipment and Processes	372
Contracts and Tenders	376
Notes and News	378
Railway Stock Market and Official Notices	380

INDEX

An index to the 105th volume of THE RAILWAY GAZETTE *covering the issues from July 6 to December 28, 1956, has been prepared, and is now available free of charge on application to the publisher.*

An Innovation in British Railway Travel

WITH the relaxation of fuel oil restrictions impending, there is welcome news of British Railways plans for diesel traction. The all-Pullman, high-speed diesel-electric trains which are to start running next year between London and some provincial cities and are described briefly on another page, set a new standard in passenger comfort and embody notable features. Built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., with General Electric power equipment and North British/M.A.N. diesel engines, they will be the first complete trains in regular service in this country to be fully air-conditioned using the latest techniques. Those between St. Pancras and Manchester will be the first for many years—other than some Continental and ocean liner expresses and other special workings—to convey only first class passengers; evidently the business traffic is expected to afford good payloads. It is interesting also, from the commercial aspect, to see more all-Pullman trains, besides a badly needed improvement in the service over the old Midland Railway route to Manchester, where, with two 1,000-h.p. diesel engines, the six-car sets should be well capable of the 3-hr. schedule, even allowing for speed restrictions and gradients. The new trains are the first in Britain to be driven by fully spring-borne motors—a feature found hitherto only in the Brown-Boveri gas-turbine locomotive. This considerable order for the home railways does not mean that the overseas market is being neglected; but it must be remembered that British Railways, the largest single railway system in the world, are bound to be large and important customers of the British manufacturers of railway material. The Metro-Cammell output, for instance, is equally divided between the home and export markets. In this case the firm, like other manufacturers, has made use of its wide experience in supplying equipment in overseas markets; it will deliver to British Railways a product which will compare favourably with any passenger train abroad—and, no doubt, the experience gained with the British Railways high-speed diesel trains will be used in due course in the design and construction of stock for railways overseas.

Improving and Equipping Indian Railways

THE Indian Minister for Transport & Railways, Mr. Jagjivan Ram, has budgeted for a surplus of Rs. 214,000,000 (£16,000,000) for 1957-58, compared with the revised estimate of Rs. 270,000,000 (£20,000,000) for 1956-57. Net traffic receipts were estimated at Rs. 793,000,000 and net railway revenue at Rs. 652,000,000; of this it is proposed to allot £438,000,000 to general revenues. Of the total allotment to the railways under the Second Five-Year Plan, Rs. 1,780,000,000 is expected to be spent in 1956-57 and Rs. 2,180,000,000 in 1957-58. The 1957-58 rolling stock import programme is stated to include 56 steam, 130 diesel, and seven electric locomotives, 24 railcars, and 68 electric multiple units. Net provision for the construction of new lines during 1957-58 is Rs. 259,000,000. It is proposed to start on the a.c. electrification of the Grand Chord line of the Eastern Railway.

New South Wales Railways in 1956

A PRELIMINARY announcement states that the earnings of the New South Wales Railways for the year ended June 30, 1956, amounted to £A75,386,106, and working expenses totalled £A74,904,373, resulting in net operating receipts of £A481,733. An amount of £A1,000,000 was received from the State Government as a contribution towards losses on working of country developmental lines and £A800,000 as a contribution towards payments due from the Government Railways Superannuation Account. Concessions allowed by the Department totalled £A535,252, including rebates on flour exported and coal for manufacture of gas, on canned fruits, and on livestock, also certain travelling concessions. Passenger journeys totalled 280,469,989, a decrease of 947,049 on the record number for the previous year. Freight traffic hauled amounted to 18,055,710 tons, a decrease of 611,077 tons on 1954-55. During the year the railways celebrated their centenary. Electric train services were extended from Blacktown to Penrith; the St. James to Wynyard (via Circular Quay) section of the Sydney City Railway was opened; and the air-conditioned Sydney-Melbourne "Daylight Express" service was inaugurated.

Solving an Induction Problem

AFTER the recent award to British Insulated Callender's Cables Limited, of the supply and erection contract for the Crewe-Manchester line, now in course of electrification, a further £290,000 contract has been

awarded to the B.I.C.C. Group for the supply and installation of telecommunication cables on this line. The presence of a 25-kV. a.c. traction system running in close proximity to telephone cables throughout their length presents difficult problems. In conventional cables the voltages induced by high load or fault currents in the overhead traction system might be high enough to cause damage to the insulation of the cable and connecting apparatus, or to endanger the lives of people using the railway telephone system. Special cables, therefore, have been developed with aluminium sheaths of sufficient thickness to give a low longitudinal resistance, and with a multiple steel tape armour of selected material to raise the external sheath impedance. Deep driven earthing rods provide earthing points of low resistance at regular intervals. The cables are protected against corrosion by P.V.C. and rubber and are finished with a coating of graphite.

Diesel Working in Ceylon

THE most striking accelerations in the passenger services on the 5-ft. 6-in. gauge lines of the Ceylon Government Railway are those of trains worked by diesel locomotives. The current timetable shows these to afford journey times of 2 hr. 45 min. over the steeply graded route from Colombo Fort to Kandy (75 miles), and 7 hr. 20 min. to Jaffna (246 miles), and 2 hr. 2 min. to Galle (72 miles), which compare favourably with the previous fastest timings with steam haulage. In general, the heaviest trains are hauled by diesel locomotives, though weight restrictions appear, at least at present, to preclude their use on certain sections, such as the Trincomalee branch. Railcars are used largely for all-stations services on principal lines, where they give a service much superior to anything that can be provided on parallel routes by public road transport; these railcar services are shown in separate tables included in the public timetables. The turnover to diesel working resulted in 1956 in very considerable reductions in expenditure on fuel. With introduction of more diesel units, further accelerations may be expected.

Overseas Railway Traffics

MIDLAND Railway of Western Australia estimated railway and road service receipts for December, 1956, were £A57,774, against £A64,619 for December of the preceding year, a decrease of £A6,845. This decline is not, however, reflected in the aggregate for the six months July-December which shows an increase of £A40,536 over the corresponding period of 1955. Paraguay Central Railway receipts for the week ended March 8, 1957, were G.1,866,812 an increase of G.560,696 on the corresponding week of 1956. Receipts continued in general to be considerably better than those of the previous year. At March 8, aggregate receipts from July 1, 1956, amounted to G.67,382,391 against G.48,015,689 for the corresponding period of 1955-56. Salvador Railway Company receipts for January were colones 453,000, compared with colones 360,000 last year; the aggregates for the seven months July-January of 1956-57 and 1955-56 were respectively colones 1,886,000 and 1,630,000. International Railways of Central America net revenue from railway operations in January was $351,772 compared with $430,582 in January, 1956, a decrease of $78,810.

Rising Costs in the Isle of Man

THE popularity of the 3-ft. gauge, exclusively steam-operated, Isle of Man Railway with visitors to the island is shown by the fact that more than 1,000,000 passengers used the line last year. The weekly runabout ticket was probably a major factor in increasing passenger journeys by 17,000 and passenger receipts by £922 compared with 1955. Parcels traffic, partly because of an adjustment in the accounting period, rose by £1,826 but merchandise and mineral traffic fell by £132. As Mr. A. C. Teare, the Chairman, made clear at the annual meeting on March 13, this narrow-gauge system is seriously affected by wage awards, which have caused wage costs to rise by more than £4,000 a year in recent years to a point where they comprise 70 per cent of total expenditure. Because the railway depends on a few weeks of profitable working each year there is little opportunity to absorb these increased costs, and they can be met only by rigid economy. Rising costs of coal and labour resulted in extra expenditure of £5,600 last year, and the disposable balance fell by £2,218 to £8,521. It says much for the efficiency of the management that the fall has been limited to this extent.

Increased Freight Rates in the U.S.A.

THE increased freight rates authorised by the Interstate Commerce Commission to the Eastern and Western Railroads of the U.S.A. at the end of last year were the subject of editorial comment in our January 25 issue. The increases were granted as an emergency matter and also covered traffic moving between those territories and the Southern territory. The Interstate Commerce Commission is reported to have approved during February a 5 per cent increase in freight rates in the Southern territory, but in this case the increase was not authorised as an emergency matter. There were, as is customary, certain so-called "hold-downs" in respect of selected individual traffics. A remarkable feature of the present American transport scene as regards freight rates is the fact that after the railway rates increases certain regional road haulage groups have been allowed to raise their rates by 5 to 7 per cent also. Our American contemporary, *Railway Age*, has aptly commented on the railway industry in the U.S.A.: "Bled by inflation, battered by competition, corseted by regulation, the miracle is the railroads do as well as they do."

Another Alpine Tunnel Electrified

ELECTRIC traction at 15,000 V. was inaugurated last month between Rosenbach in Austria and Jesenice in Jugoslavia, eight miles, including the five-mile Karawanken Tunnel, through the range of that name in the Eastern Alps. The opening ceremony was performed by the Austrian Minister of Transport, Dr. Karl Waldbrunner, accompanied by the General Managers of the Austrian Federal and Jugoslav State Railways, Dr. Maximilian Schantl and Mr. B. Bogovac. Each country was responsible for conversion work on its own territory but trains are being worked by the Austrian authorities. The Karawanken Tunnel always has been very hard to ventilate. It runs north and south and because of the prevailing winds, a tunnel so placed is much more difficult to keep free of smoke and steam than one running east and west. From this point of view, therefore, electrification is to be welcomed; but it will also greatly facilitate operation of traffic along the important Tauern route to and from Jugoslavia, which has lately much increased. Trains can now run through to Jesenice without time-wasting change of locomotives at Rosenbach. The Karawanken electrification is complementary to that of lines in the southern part of Austria referred to editorially in our issue of November 23, 1956. The total electrified route mileage of the Austrian Federal lines is now stated to be just over 27 per cent of the whole.

Detecting the Last Vehicle

MANY proposals have been made and some tried in practice, such as the Bäseler-Hampke optical tail signal detector, applied in Germany, for proving independently of any track circuit or axle-counting equipment, that the last vehicle of a train has passed a given point and the section of line in rear is free for another movement. The "striker bar," originally used on the Liverpool Overhead Railway, and the contact brush attached to the last bogie of a train, seen at one time on some London tube lines, were examples of this idea. A derivative of the last-mentioned plan has been applied in India in connection

with intermediate signalling and was illustrated in our issue for August 30, 1946. Some correspondents there now suggest the application of a movable striker bar, affixed to a vehicle, as a train tail detector, acting in conjunction with a ground contact box and, if interlocking block is in use, a track circuit also. A device of this type was patented many years ago in the United Kingdom by W. E. Langdon, then Telegraph Superintendent of the Midland Railway, but seems not to have reached the practical stage. There are certain objections to the use of striking mechanisms of this kind, and we shall be interested to know if any trial is made of the one proposed by our correspondents and, if so, with what results.

Locomotive Firing

THERE are some 18,000 steam locomotives on British Railways, and much has been, and is being, done to improve the technique of locomotive firing, by providing mobile schools with the necessary equipment for demonstration purposes and lectures by qualified staff. Such measures are essential to efficient railway operation in view of the considerable potential savings which can accrue through adequate and thorough training of footplate staff, apart from the abatement of unnecessary smoke and its attendant inconveniences, specially in built-up areas. With the object of providing further technical instruction, the British Transport Commission has issued an illustrated booklet. This, while not laying down a rigid formula for firing, serves to give the fireman a better understanding of the principles involved. It is estimated that if the least efficient fireman could improve his technique to within 50 per cent of that of the best fireman, British Railways would achieve economies in coal consumption to the value of some £4,000,000 annually. The practical aspect is clearly shown by the inclusion in the booklet of some useful firebox diagrams which illustrate the correct and incorrect technique and their results.

Railway Wage Settlement

THE difficult and unusual situation in which the British Transport Commission and the National Union of Railwaymen were placed by the majority and minority reports of the Railway Staff National Tribunal earlier last week has been relieved by the compromise reached on Friday. The Tribunal majority award of 3 per cent against the union claim for 10 per cent, with the N.U.R. nominee, Mr. E. Hall, suggesting an undefined percentage addition, was surprising in that it did not improve on the 3 per cent award made by the Tribunal to members of the Associated Society of Locomotive Engineers & Firemen last December, even though the Commission itself had made an improved offer in January. No doubt the Tribunal based its findings on the cost of living, which had risen only slightly in the intervening months—one of the main points stressed at the hearing before the Tribunal. In the event, the talks between the Commission and the N.U.R., which started immediately the award was known, have resulted in the offer and acceptance of an increase of 5 per cent from March 4 estimated to cost the Commission something more than £14,000,000 a year. This sum the Commission cannot afford. Indeed, with the present rate of deficit it could not afford any increase whatsoever, but it nevertheless has to ensure the goodwill of the staff in carrying out the railway modernisation programme. This may be one of the main reasons why the Commission has exceeded by so great a margin the amount awarded by the Tribunal—which had already been rejected by the N.U.R. as "an insult." It is officially stated to take account of the improved efficiency which already has been reported in some spheres of operation of British Railways.

Both the Commission and the N.U.R. have stated their determination that co-operation towards efficiency shall continue, and a tangible result of the recent negotiations is the N.U.R. announcement that it is prepared to discuss jointly with all concerned, and as a matter of urgency, the possibility of making progress towards an agreement on the important—and controversial—question of the manning of diesel and electric locomotives. This question would obviously need the co-operation of A.S.L.E.F., whose recent relations with the N.U.R. have not been particularly happy, but the fact that members of A.S.L.E.F. have now received an additional 2 per cent increase in pay through the efforts of the N.U.R. may overcome some of the prejudice felt. The agreement reached last Friday includes a 3 per cent increase to all railway salaried and conciliation staff, except footplate staff, from November 26, 1956, to March 3, thus putting other railwaymen on the same level as footplate staff, who had an increase of 3 per cent from November.

One of the most important items in the joint statement issued after the wage discussions is the suggestion that periodical reviews of wage levels should take place between the Commission and the railway trade unions. This is apparently intended to ensure that wage demands should not be presented too frequently and should be co-ordinated to some extent. The proposed reviews would take into account all changes affecting level of pay, including the progress of the modernisation plan and increasing productivity, and also "exceptional factors outside the control both of the Commission and of the unions" by which presumably are meant the rising cost of living and possibly wage increases in other industries. The N.U.R. is giving consideration to this and it seems probable that the same proposition will be put to the other unions affected. If this could be agreed, it would in effect produce some of the benefits of the wages contract system, allowing calculations to be based on fixed wage costs for a given period. The benefits to the Commission in computing charges would be considerable, and the unions would gain by the knowledge that any case for higher pay would be heard automatically at a given time without the need for special negotiations. It might well be accepted by the Transport Salaried Staffs' Association as an alternative to its present sliding-scale proposals. In the quieter atmosphere in which these meetings might be expected to be held, it would, perhaps, be possible to devote attention to the question of differential payments according to work and responsibility which tends to be lost sight of in the sound and fury of national demands for block increases, especially when, as now, several are in progress at once.

Work Study on British Railways

THE impressive progress made by the British Transport Commission in introducing work study techniques was described by Mr. E. J. Larkin, Director of Work Study, B.T.C., in a paper read to the Railway Students' Association in London last week. There is often some vagueness about what is implied by the term "work study" and Mr. Larkin's definition of it as "the critical examination of any work with a view to making the most economical and effective use of men, materials, equipment, and buildings" is probably as good a general description as could be given. He amplifies it, however, by pointing out that work study is not confined to highly repetitive operations. It can be applied to jobbing, maintenance, or similar work in which there is little or no repetition of particular operations. Another factor of importance on which he lays stress is that new and costly mechanical equipment is by no means always necessary before the benefits of work study can be realised. By careful analysis of a process and the operations concerned in it, it may be possible to eliminate unnecessary work and motions and to institute simple practical work-reducing methods. Furthermore, there is as much scope for work study in non-technical as in technical departments and it can be used with profit in examining office methods.

Work study is usually divided for convenience into two parts, method study and work measurement. The two groups of techniques are in practice interdependent. Method study is concerned with finding better ways of doing work through improvements in layout and design;

working procedure; use of material, plant, and equipment; use of manpower; and working environment. The techniques of method study aim at revealing and analysing fully the facts concerning any situation, at examining those facts critically, and at developing from the examination of the facts the best answer possible in the circumstances. Many of the special techniques are related to the recording of information. They include the preparation of operation process charts, floor process charts, double-handed charts, and string diagrams. Much use is made of a system of five symbols representing basic types of event. These consist of a circle signifying "Operation," in which something is produced or accomplished; a square, signifying "Inspection," in which something is verified; an arrow, signifying "Transport," in which something is moved; a "D" signifying delay; and a triangle signifying "Storage," or a holding period. By the use of these symbols any process can be charted.

Work measurement is the determination of the proper time to be allowed and of the effort required for the effective performance of a given task. It thus has a dual function as a tool for investigation and for setting performance standards. It allows more efficient manning of plant, better planning and control, and—a point of increasing importance on the railways—provides a basis for incentive bonus schemes. Mr. Larkin, though recognising the importance of wage incentive schemes, regards them as a by-product of work study. Work measurement can be by direct observation, using time study, or by predetermination through synthesis where the work is considered detail by detail. It can also be obtained by analytical estimating from standard data. The British Standards Institution has been examining work study for some years and may soon issue recommendations on work measurement.

To a limited extent, work study, and particularly method study, has been used for many years by British Railways and some of the former railway companies. The main locomotive and carriage and wagon workshops are cases in point. In these establishments, among others, work measurement also has been covered in part by the extensive use of piecework. Tonnage bonus schemes at large goods depots partake of the same nature. During the past few years, progress has been rapid on the railways, and many investigations are also being carried out by industrial consultants and the various Divisions of the Commission. The former timework establishments of the Civil Engineers' Departments of British Railways are to the fore in this, and in the Southern Region particularly considerable progress has been made with schemes for permanent way work.

As Director of Work Study, Mr. Larkin, himself a mechanical and electrical engineer of great experience, is responsible for providing a specialist advisory service in work study to the Regions of British Railways and the other Divisions of the Commission. He is also charged with establishing a central pool of experience relating to the application of work study to transport problems, with advising on the co-ordination of relations with the trades unions on this subject, with advising the Divisions and Regions on the use of industrial consultants, and with organising a work study training centre at The Grove, Watford. This last is to be the Commission's main centre for work study training; all the courses will have a strong practical bias towards the requirements of the transport industry. The 10-week courses will be attended by staff from all Divisions to ensure cross-fertilisation of ideas. Those taking the 10-week courses will be departmental work study officers, assistant district officers, assistant works managers, production engineers, and heads of sections in all Divisions. There will normally be 15 students taking this course, the first of which is now running. There will also be 15 students in one of two other groups. These will be taking appreciation courses. Appreciation courses of two days' duration will cater for the most senior level of management in the organisation, including General Managers and heads of departments within the Regions and Chief Officers at the Commission headquarters. Similar courses, but lasting one week, will be taken by assistant departmental officers, Divisional officers, district officers, works managers, and so on.

The Commission has appointed an Advisory Committee to assist the Director of Work Study and the Principal of the Work Study Training Centre with the object of ensuring that the centre meets the needs of the various activities of the Commission and is constantly refreshed by outside experience. Representatives of the Commission, Industry, and the trades unions have been invited to serve on the committee under the Chairmanship of Sir J. Landale Train, Member of the Commission, who is also Chairman of the British Railways Productivity Council, which has pronounced strongly in favour of work study. Eventually, the various Divisions and Regions, as far as is reasonably practicable, will have their own work study organisations. To ensure consistency of practice, a Work Study Development Committee has been set up. On this sit the senior Work Study Officers, or Work Study Assistants, of each Region of British Railways or Division. The Western Region already has a school at Paddington which has been running for some 15 months, and the Chief Civil Engineer, Southern Region, has had a school for his own staff in operation at Victoria for 18 months. The senior staff of all Divisions, however, will attend the Watford centre.

Mr. Larkin's paper shows that the Commission has moved, with the co-operation of the trades unions, a long way towards introducing work study on a wide scale. It is a development from which all stand to gain and none to lose. The most effective use of staff and materials implies only that work will be done in the best way. It may well prove to be the easiest and most profitable way for the staff.

Locating Subsidence Slip Planes

SLIPS or subsidences in embankments and cuttings are among the most common problems that the engineers have to deal with, and to do so effectively correct location of the slip plane or shear point between the sliding upper soil and the stable material below it is essential. "First-aid" temporary repairs usually have to be done to keep traffic moving, but these generally entail packing the top of the embankment and removing material from the toe of the cutting, measures tending to encourage continuation of slipping subsequently.

However, in locating the slip plane, advantage can be taken of this continued slipping to use the alkathene tubing method which is rapid and cheap and requires no trial pits or bore holes. We are indebted to Mr. M. G. R. Smith, Chief Civil Engineer, British Railways, Western Region, for details of this method.

Where the soil is non-cohesive or of soft cohesive material, a length of standard auger tubing is driven vertically to a depth well below the probable slip surface. Down it a length of alkathene tubing is passed and the auger tubing is then withdrawn leaving only the point and the alkathene tube in the auger hole. Alternatively, if the soil is of a stiff cohesive material, a length of ½-in. rod fitted with a 1⅛-in. dia. point can be driven to the required depth and then withdrawn leaving a hole down which the alkathene tubing can be passed.

As the slip continues to move the alkathene tube will become deformed by shearing action at the slip plane. The depth of the point of shear can be ascertained by lowering a ¼-in. mandrel down the tubing until it is obstructed by the deformation; the length of mandrel-plus-cord in the tube indicates the depth. It is advisable in this plumbing to use the longest mandrel that would freely pass down the full length of the tube immediately after its installation.

In both cases the alkathene tubing can subsequently be withdrawn, so that apart from the auger point left in the softer soil, no material is expended. Also, it has been found that, employing one man, six 20-ft. lengths of alkathene tubing can be placed in position within 3 hr., so that the whole operation is rapid and cheap.

C.I.E. in 1955-56

THE annual report of Coras Iompair Eireann, of which Mr. T. C. Courtney is Chairman, for the year ended March 31, 1956, shows a loss of £1,625,542 compared with £866,535 in the previous year. There was an improvement in passenger and merchandise traffic by rail during the year, the first being attributable to the very fine summer and the second to an increase of some 60,000 tons in imported raw sugar.

Some of the principal results are given below:—

—	Year ended March 31	
	1955	1956
	£	£
Railways—		
Passenger receipts	2,541,949	2,633,315
Goods receipts	4,114,731	4,052,611
Miscellaneous receipts	48,938	51,484
Total receipts	6,705,618	6,737,410
Expenditure	7,429,158	7,960,632
Loss	723,540	1,223,222
Road Passenger—		
Receipts	5,062,264	5,326,014
Expenditure	4,403,390	4,645,650
Profit	658,874	680,364
Road Haulage—		
Receipts	1,879,563	1,847,745
Expenditure	1,732,183	1,765,120
Profit	147,380	82,625
Canals, loss	51,839	65,122
Docks & Harbours, loss	12,650	9,735
Hotels, Refreshment Rooms, and Restaurant Cars, profit	26,578	28,892
Total loss	866,535	1,625,542

The feature of the year, as the report makes clear, was the introduction of the first 1,200-h.p. diesel-electric locomotives ordered from Metropolitan-Vickers Electrical Co. Ltd. By the end of the year, 33 had been delivered. The three diesel-mechanical locomotives of 214 h.p. placed in service on the narrow-gauge West Clare Section completed the conversion of that line to diesel traction.

Although the 10 per cent increase in rail passenger and freight charges did not come into force until February 1, 1956, receipts from passenger train traffic were higher by more than £90,000 than in the previous year. There was an increase of some 417,000 passengers on the Dublin & South Eastern Section, and 216,000 on the Waterford & Tramore Section. Excursion traffic increased, and the "Radio Train" retained its popularity both for excursion traffic and pilgrimages to Knock Shrine. First class travel declined, but the small decline in receipts indicates that the loss was mainly in short-distance passengers who may be assumed to have made greater use of motorcars. New rolling stock put into service during the year included 10 main-line third class lightweight coaches and 15 third class suburban lightweight coaches. Heating vans fitted with automatic oil-fired boilers are being provided for passenger trains hauled by diesel-electric locomotives, and 36 of these were put into service.

There was an overall increase in merchandise tonnage and receipts. The imported raw sugar already mentioned played an important part in this and some 30,000 more tons of cement were carried as a result of increased manufacturing capacity at Limerick. Revenue from bulk carriage of tar and bitumen rose by some £20,000 and the demand for this service has increased. During the year, 28 rail tank wagons of 1,200-gal. capacity were remodelled to take 3,000 gal. each. Diversion to traders' own transport was partly responsible for the decline of more than 200,000 in the number of livestock carried, but marketing conditions also played a large part. A fall of 14,000 tons in millstuffs and cattle food is also attributed to greater use of traders' own transport. The smaller acreage under beetroot was reflected in the fall of 100,000 tons in this traffic. The 382 new freight vehicles put into service included 200 open goods wagons, 100 cattle wagons, 50 timber trucks and 25 flat trucks.

Good progress was made in changing over to diesel traction, and the economies expected were achieved. Rising costs, however, more than offset these economies. Increases in rates and fares had the effect of diverting traffic to private road transport. The report states that because of the continued withdrawal of traffic from the Board's services, it is apparent that the economies which can be achieved by the change-over to diesel traction and otherwise, will not, of themselves, be sufficient to eliminate losses in the undertaking. If the undertaking is to pay its way, it considers steps must be taken to divert to rail all the traffic—particularly the heavy long-distance traffic—which the rail services can carry. The Board has constantly asked that this be done. The alternative is State subsidies on an ever-growing scale.

Railway Communication Systems

WITHIN a few years of the opening of the Liverpool & Manchester Railway, the success of which left no doubt about the practicability of the new method of transport, the electric telegraph, until then little more than a scientific toy, was shown to be not only a technical but a commercial possibility. The railway could not have become what it so rapidly did without the aid of this remarkable development in means of communication, which, of course, greatly facilitated the transaction of general business and of train working. It was especially fitting, therefore, that the first trials in 1837 of Cooke and Wheatstone's apparatus should take place on a railway, the London & Birmingham, between Euston and Camden. That railway did not then make use of it, but the Great Western did so almost immediately and soon the telegraph was in operation between London and West Drayton, and later was extended to Slough. It was opened to public service in April, 1844, under the "special patronage" of Queen Victoria and Prince Albert, and the public was "respectfully" informed that, owing to the incredible velocity attained by the "electric fluid," some 50 signals could be "transmitted to a distance of 280,000 miles in one minute." A charge of a shilling was made to see the apparatus, which achieved much popularity when on New Year's Day, 1845, a message sent by it led to the dramatic apprehension of Tawell for the Salt Hill murder.

As in America, under the influence of Morse and using different equipment, so in Great Britain the benefit to the community of a good network of telegraphs was quickly recognised and more than one company formed to erect and operate the lines, which frequently followed the railway routes in order to link the principal centres, between which communication was, as a rule, first established. The character of railway business, of course, called for such facilities and today, although ordinary public means of communication have been for just over 87 years in the hands of the State, it is interesting to note that the railways are the largest "private" users of telegraph and telephone circuits. This was emphasised by Mr. D. M. Clarke, when giving his paper before the Institution of Railway Signal Engineers on January 16, treating means of electrical communication as applied to railway operation. It seemed particularly appropriate that he should be connected with the Western Region, along whose lines the first regular electric telegraph service was opened over a century ago. The telephone did not appear until the end of the 70s, and in due course it was ruled in 1880 that the provisions of the Telegraph Acts of 1868 and 1869 applied to it and that public telephonic communication also was under the control of the Postmaster General, who eventually gave concessions to private and municipal enterprise in this field. At the transfer of the telegraphs in the United Kingdom to the State on February 5, 1870, there were three companies working the greater part of them. The single-needle instrument had come to be very generally used on the railways with good results and but slowly gave place to other apparatus. Even now it is often seen and there are some who prefer it to the telephone, at least for certain classes of message work, just as teleprinter equipment is held to be superior for others.

Railway requirements call for a considerable variety of communicating arrangements. Some are needed to deal

with general purpose business which, of course, is similar to that transacted by individual members of the public or commercial firms and can be dealt with along broadly similar lines, with here and there provision for meeting special conditions. Other equipment must cater for circumstances peculiar to railway operation, which partakes of a linear character and necessitates facilities for exchanging information all along a route and, as flexibly as possible, between the numerous points of importance on it, such as signalboxes, yards, stations, etc., which must be able to communicate with each singly and in combination. A message may have to go to the next signalbox only, or to one some distance away or even several together. Numerous designs of circuit and instrument have in the course of time been developed to meet these many needs.

Economy necessarily plays a large part in the picture. Construction and maintenance of circuits is expensive and it is essential to use wires to the maximum advantage. This was recognised long ago and gave rise to the duplex and quadruplex methods of telegraphy and systems for superimposing telephones on telegraph circuits. In more recent years the remarkable development of "carrier" methods has revolutionised our ideas and resources and the paper stressed the great progress achieved in extending the scope and general efficiency of railway trunk and other types of circuit, now able to afford facilities which at one time would have been out of the question on economic grounds. Mr. Clarke forecast an extension of both telephone and teleprinter automatic working and it is known that the modernisation plan for British Railways includes the extensive application of the latest improvements in this field.

LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of correspondents*)

Locomotive Turning Triangles

March 20

SIR,—I refer to the Scrap Heap of March 15, and would remind you that a turning triangle for reversing passenger trains was installed at Ashover Butts Station on the 2-ft. gauge Ashover Light Railway. The line was opened in April, 1925, and described in the October, 1925, issue of *The Railway Magazine*, which included an illustration of a train on the triangle. I can recall several triangles formed by running lines used for locomotive reversal, but I suggest that this was the only example in this country installed specifically for reversing complete trains.

Yours faithfully,

R. E. TUSTIN

53, Cambridge Road, Cosby, Leicester

Corrugated Rails

March 15

SIR,—The editorial note in your February 22 issue about corrugated rails appears to give the impression that the development of rail grinding cars to counteract rail corrugation was carried out entirely in Germany in the 1930s.

The fact is, of course, that in the 1930s we, too, were using rail grinding cars of similar design to those described by you. These cars were numbered RG. 800 and RG. 801, and were placed in service as rail grinding cars in 1931 by the Underground company and in 1936 by London Transport, respectively.

Yours faithfully,

R. M. ROBBINS
Chief Public Relations Officer

London Transport Executive,
55, Broadway, S.W.1

[Our purpose in mentioning the German grinding cars was to emphasise the difference in the principle of working. Reference to the conversion of London Underground vehicles as grinding cars some 25 years ago, was made in the article on page 224 of our February 22 issue. —ED., *R.G.*]

Locomotives or Multiple-Unit Sets?

March 8

SIR,—With reference to the two letters published in your issue of March 8, whilst I agree with Mr. P. Weil that multiple-unit motor coaches do serious damage to the track and to themselves, I cannot agree that this is inherent; a higher centre of gravity and lower unsprung weight ought to be possible.

Mr. G. E. Penfold considers that the Southern Region stock is satisfactory. Even for the rather specialised services of this Region, he condemns his own case by enumerating all the different units required. How much greater the variety for the whole country! Too many types, with small numbers of each, inevitably leads to an uneconomically large number of spare units.

Yours faithfully,

JOHN RODGERS

132, Worrin Road, Shenfield, Essex

Site for a Transport Museum

March 25

SIR,—Manufacturers of railway equipment throughout the world require a periodic railway exhibition on a site with rail access for locomotives and rolling stock.

Britain has been slow to open her exhibitions to foreign manufacturers, but the opportunity should now be taken to redress this omission in one field, and provide a substantial revenue to assist in supporting a transport museum within the same buildings.

Yours faithfully,

B. E. BALDREY
Director

William Jones Limited,
Adam House, 1, Fitzroy Square, W.1

March 18

SIR,—I think that the idea of a single national museum will have to be abandoned and that several regional museums will have to be established. Dispersal of the British Railways collection would be all to the good, as the enthusiasts, who would be the main frequenters of such museums, are scattered all over Britain, and most of them would agree that preserved locomotives and rolling stock should, as far as possible, be kept in areas where they have worked in the past. Local patriotism is still a vital force; for example, many people in the North feel that *Gladstone* and *City of Truro* are out of place in York Museum; nor would many of us be very happy to see N.E.R. or G.N.R. locomotives, say, at Swindon. Part of Brighton Works might be reserved for the Southern Region collection only, and for the relics of other English railways, what better places, besides York, could be found than Swindon, Doncaster, Derby, and Crewe?

As to the rest of Britain, the collection now being built up by the Irish railways could be divided between Belfast and Dublin; and the railway relics of Wales are likely to be entirely narrow gauge, for which adequate space is available at Towyn and Portmadoc. For Scotland, I would let Edinburgh and Glasgow come to some mutual arrangement.

Yours faithfully,

E. E. SMITH

Castle View, Stagshaw Road, Corbridge, Northumberland

THE SCRAP HEAP

"Wings" at Waterloo

Whenever I'm on leave in London, I'm always considerably amused by the reactions of rush-hour travellers in Waterloo station to the music played over the loudspeakers. If it's military music, the crowds seem to march very smartly, and in time, across the station.

The other evening, the R.A.F. March Past was being played, and I'm prepared to swear that the incline of the average chin was several degrees higher in automatic response to this stirring tune.—*From the "Evening Standard."*

First Class to Barchester

Anthony Trollope, the perfect civil servant, was one for meticulous method . . . Timing himself by a stop-watch, he would sit down to write 250 words to a page to each quarter of an hour. He never wasted a moment if he could get on with writing. With the help of a portable writing desk he could compose with equal facility on railway platforms, in coaches, and on board ship. Is it too fanciful to believe that the gentle rhythm of "Barchester Towers" owes a lot to its having been written mainly from the deep upholstery of a Victorian first class railway carriage?—*From "The Manchester Guardian."*

Fifty Years Ago on the L.T.S.R.

We are indebted to a correspondent for the photograph reproduced below, which depicts Plaistow Shed, London Tilbury & Southend Railway, in 1903 or 1904. The figure in front is believed to be the late Mr. R. H. Whitelegg, whose death was recorded in our March 15 issue; he was, in 1903-04, Assistant Locomotive Superintendent of the L.T.S.R. The locomotive on the left is one of the two 0-6-0 tender locomotives owned by that railway. On the right is a District Railway 4-4-0 tank engine; this would be working over the Whitechapel & Bow Railway, which had been opened in 1902; District electric trains began running over the Whitechapel & Bow and the Tilbury Line tracks via Plaistow to East Ham in 1905.

The Harmful Pigeon

The London pigeon is alternately pampered and persecuted. Local authorities and other public bodies seem almost without exception to be in favour of thinning out pigeons if it can be done successfully. On the other hand, any serious attempts to reduce their numbers are met with anguished protests from the public. . . . The pigeons are considered a nuisance at Victoria, largely on account of the pigeon-lovers, who by scattering food, mainly bread, for the birds make the approaches to the station slippery, particularly in wet weather, and therefore dangerous for the public. Added to this there is the complaint that pigeons foul and may even damage the stonework and brickwork of London buildings. . . . A complication today is that pigeons—town pigeons, that is—are no longer considered worth eating. There is thus no sale for them.—*From "The Times."*

Early Railways in North Africa

Sir Morton Peto has received an invitation from the Emperor of the French to proceed to Algeria with the view to the construction of a railway in that colony. . . . The line to which attention is to be devoted in the first instance will commence at Constantine, one of the principal towns in the colony, and connect that place with another important point. The length of the line at present projected is about 100 miles. —*From "The Scotsman" of March* 4, 1957.

[The first section of line to be opened in Algeria seems to have been that of the Algerian Railway Company, built in 1860-62 and opened in 1862; the line was worked by the Paris Lyons & Mediterranean Railway Company, as part of its Algerian system (P.L.M.A.), from 1863 until 1933, when the P.L.M.A. and the Algerian State Railways came under the management of a joint administration, that of the Chemins de Fer Algériens. Sir Morton Peto was the well-known contractor.—ED., *R.G.*]

New Zealand Engine as Monument

A New Zealand locomotive, *Opossum*, has been resurrected from the bush on the west coast of the South Island. It is intended that it eventually finds a last resting place as an historic monument in Greymouth. *Opossum* was the first locomotive ever built in New Zealand, appearing first in 1876 on a private line from Foxton to Palmerston North. It then ran on the Midland Line from Greymouth, and was later used by the Greymouth Harbour Board before being acquired in 1911 to haul logs to a sawmill on the West Coast. When it became redundant two years ago, after 78 years of service, it was virtually abandoned on a siding and became overgrown with vegetation. Now the Greymouth Junior Chamber of Commerce hopes to preserve the engine in that town.

Vanished Porters

(Complaints of lack of porters for ordinary trains at Victoria)

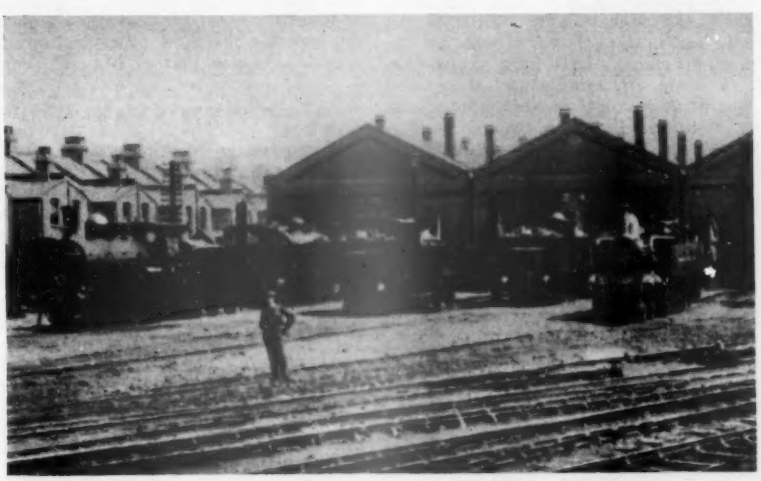
Some poor correspondent, lately,
Asked a question which has greatly
Exercised and puzzled many a master-mind:
In the interim that passes
Between trains of luxury classes,
Why are main-line station porters hard to find?

This, of course, is in relation
To the shock troops of the station,
Not to Tom, or Dick, or Harry, or the like—
Those who sing "*Sic transit gloria*"
As the "Arrow" leaves Victoria
And retire to unknown regions for a mike.

Continental baggage-shifting,
Like most other heavy lifting,
May necessitate some massage on the bench;
On the other hand, the porter
May be doing what he ought ter,
And be busy brushing up his bit of French.

Though, to your exasperation,
They withdraw from circulation
When you need them most, there is this consolation:
Their return, coincidental
With the next big "Continental"
Is the nearest thing we've got to automation.

A. B.



Plaistow Shed, L.T.S.R., in 1903 *or* 1904, *showing* (*left*) *one of the two "A" class freight engines, and* (*right*) *District Railway* 4-4-0*T*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Progress on the Mokameh Bridge

During the 1956 monsoon the maximum discharge of the river Ganga (Ganges) at the bridge site was 1,850,000 cusecs in September. The guide bank and also the embankment closing the North Channel of the river stood up very well without any damage. During the current season the approach bank has been raised to full height and all the earthwork from Barauni to the north abutment was due to have been finished by the middle of this month.

The work on the pier foundations is progressing well and according to the schedule. It is expected that all piers will be completed up to bed-stone level by June, 1957. Steel required for the main girders of this bridge is being supplied by mills in the United Kingdom, but there may be some delay in the fabrication on account of the late delivery of steel. The quantity of steel reported in February to have been received was 7,264 tons out of the 11,765 tons on order; a further 964 tons were then stated to be ready for shipment to site.

Six of the 15 piers completed on the Mokameh Ganges Bridge, and six in various stages of construction

VICTORIA

Brown Coal Dust as Locomotive Fuel

An article in our issue of August 25, 1950, described the tests conducted with pulverised brown coal as a substitute fuel, especially for freight engines. In addition, research carried out in U.S.A. with samples of brown coal dust produced at Yallourn, Victoria, also disclosed that it would make an ideal fuel for gas-turbine locomotives. It is now announced that, although the tests showed that the brown coal dust was a satisfactory fuel, economic factors have caused the large-scale locomotive conversion programme and the experimental operation of two locomotives as brown coal dust burners to be discontinued.

Residual oil fuel, now produced as an end-product of Victorian oil refineries, has dropped considerably in price and high grade New South Wales coal is now available to the Victorian Railways at attractive prices. On the other hand, brown coal dust has increased to double its original cost.

Furthermore, diesel-electric and electric locomotives are so efficient and economical to run that there is no justification for undertaking the heavy capital expenditure involved in further expansion of brown coal firing. Accordingly, the specially fitted locomotives are being re-converted to black coal or oil firing, and their special firing equipment has been offered for sale. If the sets are not purchased, they will be stored against a future fuel emergency.

Apart from the black coal they have saved, experiments conducted with the two locomotives have proved of inestimable value. They have shown that if a state of emergency arose and Australia's oil supplies were jeopardised, the Victorian Railways could convert a number of locomotives to brown coal firing (including many of those now burning residual oil) to supplement the fleet of black coal burners.

RHODESIA

New Trailer for Road Motor Services

A recent conversion by the Rhodesia Railways Road Motor Services has provided a prototype trailer for the carriage of lucerne, hay, and other low-density commodities. The body of this four-wheel trailer is 26 ft. long and 8 ft. wide, which with a 20-ft. wheelbase makes for steady riding behind the towing vehicle. The wire mesh sides, which are fixtures, give a loading height of 4 ft.—a very useful feature in terms of low-density traffic. The tailboard is easily removable to accommodate loads exceeding 26 ft. The trailer now has a gross weight, including a payload, of 6 tons, well within the axle loading restrictions. Road tests have indicated remarkably good riding qualities, and the trailer tracks well behind the towing vehicle. Airbrakes are fitted.

January Traffic Figures

During January the tonnage of coal and coke railed from Wankie amounted to a record of 321,649 tons compared with the previous record of 319,000 tons achieved in March, 1955. Of this quantity 85,106 tons were consigned to the Northern Rhodesia copper mines. The total chrome movement during January was 67,800 tons and over 117,000 bags of maize were loaded for export via Beira.

ISRAEL

Construction of Line to Eilath

A tender is reported to have been submitted by a French company for construction of a railway from Beersheba to Eilath, with a branch line to the Dead Sea. The same company, if the tender were accepted, would undertake the first stage in the development of the port of Eilath.

TURKEY

Istanbul Suburban Electrification

Electrification at 25 kV., 50 cycles, is reported to have been completed of the first section of the State Railways (T.C.D.D.) main line from (Istanbul) Sirkeci, along the shore of the Sea of Marmora to Halkali, some 17 miles. The multiple-unit stock running over this line was described in our issue of September 30, 1955, and Bo-Bo locomotives for this and other sections of the T.C.D.D. in that of May 25, 1956.

UNITED STATES

Pennsylvania Multiple-unit Trains

The Pennsylvania Railroad has placed an order with the Budd Company for six 85-ft. ultra lightweight coaches of the makers' new Pioneer III type, with an option on the purchase of 44 more if the new cars prove suitable for suburban and outer suburban service on the electrified New York-Philadelphia-Baltimore-Washington line.

Each car will seat 132 passengers in reversible seats, five abreast, so that a train of three will accommodate nearly as many passengers as a six-coach train of the existing P.RR. multiple-unit stock. Each of the cars will be equipped with four traction motors of a new design, which will accelerate the 37-ton vehicle from a standing start to

30 m.p.h. in 25 sec. A three-car train will weigh 11 tons and seat 396.

The first experimental Pioneer III car has been in service for four months, covering 50,000 miles over the Pennsylvania main line between New York and Washington, and in smoothness of riding and low level of noise is reported to have given satisfaction, whilst fatigue tests showed no weakness.

ARGENTINA

Railway Bridge Damaged by Terrorists

Supporters of the previous government, who have recently been executing a number of acts of sabotage, dynamited the petrol pipeline connecting the distillery at La Plata with Buenos Aires on February 13. The intense heat caused by the burning petrol buckled the steelwork of the neighbouring railway bridge, carrying the Buenos Aires to La Plata line. Fortunately one of the tracks was not damaged so severely as to preclude its use after necessary supports had been placed underneath, thus avoiding the complete interruption of traffic.

BRAZIL

Progress on Central Railway

Electric trains are now running between Rio de Janeiro and Volta Redonda, where the National Steelworks is situated.

During 1956 the Central Railway daily revenue increased from 2,800,000 to 11,000,000 cruzeiros, due to tariff adjustments and reforms. Carrying capacity was increased by the reconditioning of rolling stock and improvements to permanent way. All worn 93-lb. rails were replaced by 126-lb. rails, and 150 miles of new lines were incorporated in the system. Nine 3,000 h.p. electric locomotives were ordered from Germany also 25 diesel-electric locomotives from the U.S.A. to handle iron ore traffic from Minas Gerais.

SWITZERLAND

Gotthard Line Improvements

The Council of Administration has now approved the plans for the reconstruction of Göschenen station, at the north end of the Gotthard Tunnel. There will be a new island platform 1,312 ft. long and 33 ft. wide, covered for most of its length and connected with the existing platform and the station buildings by two subways. Between this and the River Reuss there will be a new loading platform for road motorcars passing by rail through the tunnel; this will be 656 ft. long and 33 ft. wide, and access to it will be by means of a new road branching from the Gotthard road just south of the station. To obtain the necessary space for widening the station, it will be necessary to build a new retaining wall, just over 850 ft. long and 23—40 ft. high, bordering the Reuss. The bridges over the Göschenen-Reuss north of the station, and over the Reuss between the station and the tunnel, will both require widening.

Work is shortly to begin on the reconstruction of certain large underline bridges between Amsteg-Silenen and Gurtnellen, including the Kärstelenbach viaduct over the entrance to the Maderanertal, 440 ft. long and 178 ft. high. In preparation, the station at Amsteg-Silenen is to be provided with an additional island platform, and the 5-mile section between there and Gurtnellen is to be signalled for single-line operation over either track as necessary while the work is in progress. The heavy occupation of the Gotthard line may be measured by the fact that an average of 145 trains passes through the Gotthard Tunnel daily, and that on Easter Monday, 1956, the total rose to 172.

Distinguishing First Class

To enable first class passengers more readily to find their accommodation in the train formations, first class coaches of the Swiss Federal Railways in future will be painted with a yellow band between the roof and the windows, which will make them easily distinguishable above the heads of waiting passengers when the trains arrive at stations.

Publications Received

British Transport Waterways Folders.—A new folder entitled "Out and about on England's Waterways" has been published by the British Transport Waterways for the information of the increasing number of people interested in holiday inland cruising. The folder, which is obtainable free from any British Transport Waterways office, illustrates the variety of English countryside, such as the Pennines, the meadows of Oxfordshire, the Dee Valley, and the Lincolnshire Wolds, that can be seen from the extensive network of British Transport canals and inland waterways. British Transport Waterways have also published two new folders about canals in Scotland, and have re-issued, under the title "Use your Waterways," a general folder dealing with the use of waterways for commercial traffic. All four of these folders include attractive photographs.

B.S.I. Yearbook for 1957.—The *Yearbook* of the British Standards Institution has just been published, of which 400 pages of this 480 page publication are devoted to a complete numerical list of the British Standards and Codes of Practice current on January 1, 1957. Apart from its main purpose as a reference directory to all current British Standards, the publication contains information about British Standards Institution, and the services it offers, including notes on the British Standards mark of approval, and the standards to which it is applied, and details of the Canadian approvals service whereby electrical gear can be approved for export to Canada before leaving this country. Other information covers lists of addresses in the United Kingdom and overseas where complete reference sets of all British Standards can be consulted, also included is a comprehensive index in which all standards are listed according to subject. Copies have been sent free to all B.S.I. subscribing members, who may purchase additional copies at the published price of 15s. less members' discount. Non-members may buy at the published price plus 1s. 6d. for postage and packing from the British Standards Institution, 2, Park Street, London, W.1.

Continuous Casting Process.—Details of the ENCON continuous casting process are given in an illustrated leaflet issued by Enfield Rolling Mills Limited, Brimsdown, Enfield, Middlesex. Included are a series of tables and graphs which give the different comparisons of properties of continuous, chill, and sand casting methods, such as ton/sq. in. elongation, with impact tests of each type. Also included are photomicrographs which illustrate the difference in lead distribution on 75/3/20 coppertin-lead alloy between ENCON continuous cast, and ordinary sand cast materials. A table giving weights of continuous cast rod are included, based on 0·320 lb./cu. ft.

Portable Welding Equipment and Electrodes.—Details of their portable arc-welding equipment and Speedees electrodes are contained in two illustrated publications issued by the English Electric Co. Ltd. Besides a general description of the portable welding sets, which are built to B.S. 638: 1954, diagrams are included giving various power-factor curves, and kVA. demand, and line current at 420 V. for equipment fitted with recommended capacitator sizes. Information on Speedees electrodes includes deposition data such as plate thickness, fillet size, and rate of deposit.

Work Study & Industrial Engineering.—The first issue of a monthly publication entitled *Work Study & Industrial Engineering* issued by Management Publications Limited, Management House, 8, Hill Street, London, W.1, contains a series of articles dealing with work study in various branches of industry. This publication is intended to provide current information of interest to works executives and others by the inclusion of articles relating to new techniques and methods based on mathematical and other sciences, with the object of increasing production, and reducing costs. Copies can be obtained from the publishers, price 2s. 6d.

Railway Operating Factors

Patterns of peak-hour traffic: line occupation by stopping trains

IN our issue of November 23, 1956, we dealt at some length with the paper, "The Outlook in Modern Railway Operation," read before the Institute of Transport in London on November 19 by Mr. S. G. Hearn, Chief Operating Superintendent, British Railways, Western Region. The charts used by Mr. Hearn to illustrate his paper are of considerable interest, and merit discussion on their own account. Two of these, dealing with the development of diesel passenger services and the relative efficiency of unfitted and fully vacuum-fitted iron ore trains, are reproduced herewith and are self-explanatory.

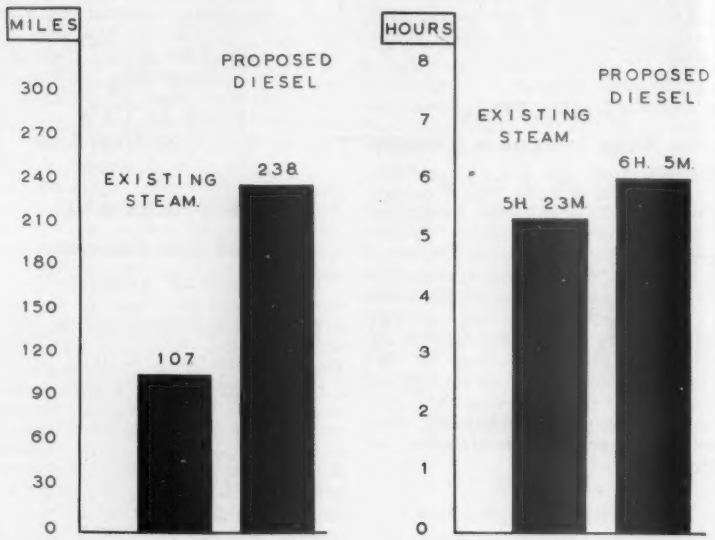
Of the remainder, one chart shows the annual cost of providing local passenger services between Hereford and Shrewsbury. The cost of existing steam passenger services is shown as £68,500, which could be reduced to £61,000 if all stops at the smaller stations were withdrawn. There is no indication of the probable reduction in receipts which would follow from cutting out the less important stations. Much more effective is the saving to be obtained by working the services with diesel trains. These would reduce the cost to £47,500, or £38,500 without stops at smaller stations. This is an impressive argument for the diesel trains. The assumption for this purpose is that the diesels would work the same timetable as that now operated by the steam trains.

A factor of importance in assessing diesel costs in relation to steam is illustrated by a "pie" chart showing that average productive hours per engine day in the West of England area are 11·5 for existing steam locomotives. This figure would be increased to 19·02 for the proposed diesel working.

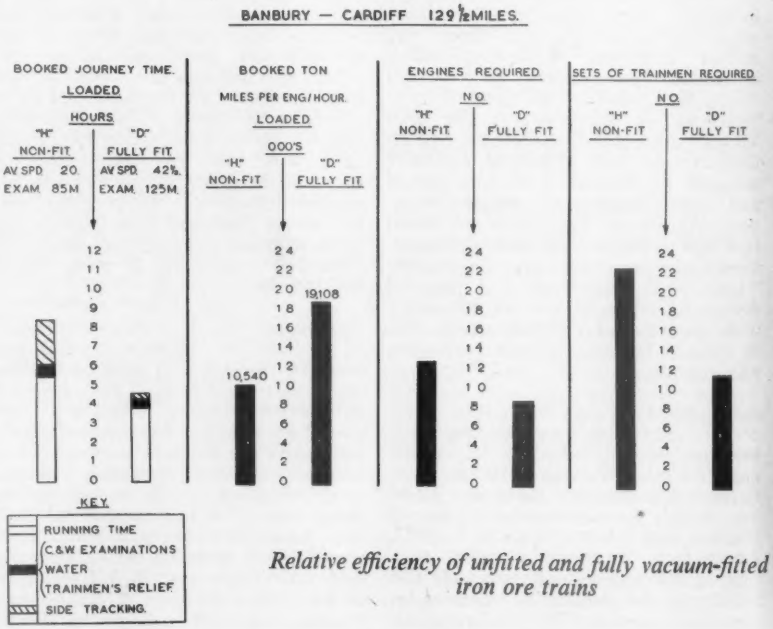
Peak Problems

The difficulties presented by daily peak traffic to railway operating departments are illustrated by charts showing the number of trains per hour at Waterloo and Victoria in the Southern Region. A contrast is provided by a chart of the number of trains to and from the Welsh Valleys at Cardiff Queen Street. The charts are not sufficiently detailed to read off exact figures or times, but that for Waterloo shows a sharp rise from the early morning culminating in a peak between 8 and 9 a.m. at the rate of 52-53 trains per hour. There is a gradual but steepening fall to some 32 trains an hour between 12 noon and 1 p.m. with a small but distinct peak at a rate of 40 trains an hour with its zenith at about 1.30 p.m. This falls slowly back to 32 trains an hour in mid-afternoon before climbing to the evening peak of 46-47 trains an hour at about 6.30 p.m. Traffic then falls back to 32 trains an hour and declines steeply in the late evening. This is particularly interesting as showing that the morning peak, often held to be less concentrated than that in the evening, is not so at Waterloo.

The Victoria chart, superimposed on that for Waterloo, shows some contrast in the traffic pattern. The morning peak occurs at the same time as that at Waterloo and runs at 40-41 trains in the hour. The evening peak, however, which occurs half-an-hour or more before that at Waterloo, is almost as high as in the morning with a rate of some 36-37 trains in the hour. There is no mid-day peak at Victoria. At the time



Development of diesel multiple-unit passenger services in the Birmingham area. On the left are shown the average loaded train miles per day per steam engine or diesel unit and on the right the average loaded train time per driver. The figures relate to Monday-Friday services only



Relative efficiency of unfitted and fully vacuum-fitted iron ore trains

of the mid-day peak at Waterloo, traffic at Victoria is the lightest in all the daylight hours.

At Cardiff, the morning peak, at 17-18 trains an hour, is spread out in the classical manner between 8 and 10 a.m. The different travel habits away from London are shown by the high mid-day peak of some 16 trains in the hour with its climax at about 1 p.m. The evening peak is the highest, with a rate of 21 trains an hour, and is sharply concentrated with its busiest time at 5.30 p.m. There is also a distinct peak, of what is sometimes called the "theatre" type, after 8 p.m.

The problem of the seasonal and weekend peaks is illustrated by a chart showing the number of express passenger trains during 24 hr. between Taunton and Newton Abbot. In winter, the normal weekday service provides for 45 trains in 24 hr., counting trains in both directions. This rises to 54 trains a day in summer. On normal summer Saturdays, however, there are 117 trains, and on peak summer Saturdays there are 213 trains. The difficulties of finding suitable rolling stock, economically, for the summer services could hardly be better illustrated.

Two other charts deal with line occupation. One shows the effect of local passenger trains on line occupation between Hereford and Shrewsbury. Again, because the chart shows representations of trains and parts of trains, exact figures cannot be given, but the effect of the withdrawal of one stopping train would be to allow seven express passenger trains to use the line. Alternatively, nearly four fully-fitted freight trains could run, or just over three part-fitted freight trains (Class "D").

Line occupation at an important junction station, not named, is shown in percentages of the 24 hr. The figures for trains in the down direction are: local passenger stopping, 30·8; express passenger, 13·1; parcels, 9·7; freight, 20; engines, 12·5; shunting, 8·3; and marginal, 5·6. In the up direction, the corresponding figures are: 31·4, 14·2, 5·6, 24·4, 6·4, 8·3, and 9·7. This chart, too, shows the large amount of time for which local stopping trains occupy the line.

Experiments with Points and Crossings

German Federal Railway trials with partially- and fully-welded frogs

A HIGH traffic density, together with high speeds, causes considerable wear to points and crossings because of the successive hammer blows to which they are continually subjected. Consequently, it is necessary to carry out periodic inspection to points and crossings to ensure there are no loose parts such as distance pieces, bolts and nuts, and so on. Economy in permanent way maintenance is claimed by the developing and patenting of partially, and fully welded frogs, by Pintsch Bamag A.G., Butzbach, Hessen.

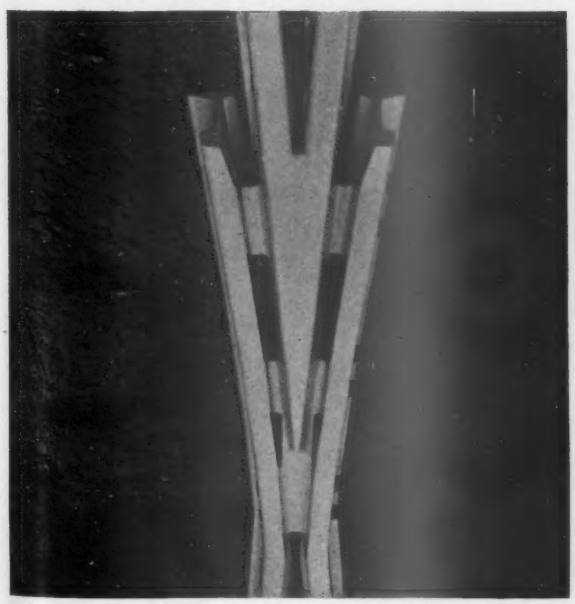
Design Features

The partially welded type of frog, in which the only loose parts are the through securing bolts and nuts has been installed on the German Federal Railway, with, it is said, considerable success. As much as 80 per cent saving in maintenance is claimed, compared with the ordinary built-up type. Trials have also been conducted on the railway for some time with the fully welded frog, and from reports, are stated to be most satisfactory.

In both types of frogs the spliced point rails are welded together to form one piece, and all parts subjected to hammer blows have been specially hardened, care being taken to control the hardening process, so that it is gradually reduced to the normal hardness of the running rail; hardening is done by a special process which gives a maximum value of 120-130 Kg./mm 2.

In both designs frogs are made up of normal rail sections. That part of the frog forming the distance piece and the nose at the point rail is made up from a forging which is welded to the point rails by flash welding. Special electrodes, as well as the treatment during and after welding, are necessary to ensure the bonding of the various components.

Care is taken during welding to avoid warping or cracking of the frog block, and final machining after welding ensures absolute accuracy. Production costs are, it is stated, higher than those of the conventional frog, but it amounts to approximately half those for cast manganese steel frogs. It is claimed that the life of welded frogs is twice that of the normal type, but cost of maintenance is almost negligible, furthermore gauge widening is eliminated. Building up of the frog by welding, after wear gives good results.



Partially-welded crossing with bolted wing rails only

Fully-welded frog and wing rails after final treatment

Use of Sand and Gravel by British Railways

Many applications: increased demands arising from greater use of concrete

By B. L. Morton,
Chairman of the Research & Standards Committee, Sand & Gravel Association of Great Britain

Dragline excavator in use for both wet and dry working at a pit in Yorkshire; the daily capacity of the plant is 1,000 *tons*

THE recently announced £1,200 million modernisation plan for British Railways is something in which the Sand & Gravel Association of Great Britain, representing an industry of which the output last year reached a new record, will have a main part to play by ensuring that aggregates are available for the concrete and other materials which will be required for many of the new works.

The railways in this country are among the largest users of sand and gravel aggregates. Railway engineers may be interested in a brief outline of the sand and gravel industry which has expanded rapidly to become, second only to coal, the largest extractive industry in Britain.

In 1919, output was 2,000,000 tons a year; by 1956 this had risen to over 65,000,000 tons a year. The industry's production is the main source of aggregates for all forms of concrete, plasters, mortars, and renderings, and for a considerable proportion of the country's roadstone.

The demand for ever greater quantities of aggregates has necessitated the progressive excavation of new areas of gravel-bearing land throughout the country. The developments in concrete technology have, in addition, brought a demand for aggregates of higher quality and to tighter specifications; this has meant modern processing plants at the new gravel workings with methods of handling and loading to meet the rising tempo of production.

Throughout England, Scotland, and Wales the S.A.G.A. has over 500 producer members operating more than 1,000 workings. The great majority of these are surface pits and quarries and the remainder are dredgings located off the coasts or in river estuaries.

Sand and Gravel Deposits

The sand and gravel resources of Great Britain have, in recent years, been the subject of an exhaustive investigation by the Advisory Committee on Sand & Gravel, whose report, generally known as the Waters' Report, provides an authoritative record of known workable deposits. The distribution of these minerals is such that they are economically available to almost every part of the country, no important centre of population or industry being more than 30 miles from a source of supply. Comprehensive surveys of the sands and gravel aggregates available have been carried out by the Building Research Station and the Road Research Laboratory respectively, both in conjunction with the S.A.G.A., and their findings are embodied in official publications.

Workings

Although the basic principles of winning, working, and processing are the same, there is remarkably little uniformity in the methods and details of equipment employed in different workings, for gravel deposits vary widely in type and location, and the nature of the deposit usually dictates the most suitable equipment for the job. Thus, the actual digging of the gravel may be done by drag-line excavator—probably the commonest method in both wet and dry pits—or by face shovel, grab, bucket-dredger, or suction pump. The transporting of the raw material from the "face" to the processing plant similarly lends itself to wide differences of method; conveyor belts, skips and rails, lorries, dumpers, barges, pipe lines, and occasionally aerial ropeways are all used. As to the plant itself, where the raw material is washed and separated into its component particle sizes, whilst the same variations in types of equipment may be observed, the standard of the products is of a generally high quality to meet the demand for aggre-

Gravel surface dressing work at Angel Road goods yard, Eastern Region

gates which comply with the appropriate British Standard Specifications.

After processing, the aggregates are stored in hoppers, bins or stock piles for loading and despatch. Loading may be by gravity from elevated hoppers or bins, or by means of a mobile crane or mechanical shovel, directly into lorries for conveyance to the building site or sometimes into railway wagons. Efficient mechanical handling is general throughout the industry's pits.

Sand and Gravel Aggregates

The advances in concrete technology, particularly in the development of reinforced concrete and in the newer field of prestressed concrete, have emphasised the need for aggregates of high quality and reliable grading. The industry has recognised this need and has played an active part in the drafting and revision of the British Standards for concrete aggregates and building sands. B.S. 882 is undoubtedly the most important of these Standards, as it provides specifications for aggregates for concrete in all its uses. The 1954 revision made a radical alteration in the method of classifying fine aggregates (concreting sands) so as to embrace all sands from which good concrete can be made and at the same time to separate them into "zones" so that the user knows the grading of his sand to within comparatively narrow limits and can design his mix accordingly. After two years of trial it appears that this innovation is working well and that the advantages of a wider choice of sands are being reflected in lower costs and concrete of more uniform quality.

Mention should also be made under this heading of the British Standards for building sands, B.S. 1198, 1199, and 1200, which were revised in 1955 on the basis of the sands survey carried out by the Building Research Station and which cover the requirements for plasters, mortars, and renderings.

Gravel track ballast near Sandown, Isle of Wight, Southern Region

Anchor structure foundation at Fenchurch Street Station, Eastern Region, showing reinforcing bars in position and mass concrete being placed from construction train

Use by Railways

The railways were among the earliest important users of concrete. Numerous structures 30 or more years old bear testimony to the good service concrete has given in the past, and the enormously increased use of concrete in recent years is an indication of the extent to which it will be required in the new programme.

The advantages of concrete are well known. It has largely replaced steel, and the economy effected in initial costs and, more particularly, in maintenance has been a decisive factor. In a paper read to the Reinforced Concrete Association last year, Mr. R. L. M'Ilmoyle stated that reinforced concrete, properly designed and executed, would normally remain in good condition and require no maintenance expenditure for at least 50 years, and that the probable life of such structures would be about 75-100 years.

Apart from structures and buildings, concrete has innumerable applications

in precast products, which have largely replaced articles made of other materials.

The railway modernisation plan includes reconstruction or major improvement schemes at Barrow Central, Cannon Street, Banbury, Glasgow Central, Chichester, Weymouth, Forest Hill, and Plymouth North Road; also a new station at Harlow New Town and the new tunnels between New Barnet and Potters Bar. It is clear that concrete has a very big part to play, and the aggregates which represent 80 per cent of that concrete must be provided in the quantities and to the specifications demanded.

Aggregates for Roads and Pavings

Apart from concrete, aggregates in very large quantities are used by the railways in the construction and maintenance of roads, yards and approaches at all the many stations, goods yards, and depots throughout the country. This market for sand and gravel aggregates is of great interest to the industry and it is important to note that British Standard Specifications exist to cover these uses. They are the following:

B.S. 594/1950: Rolled asphalt with gravel aggregate.
B.S. 1241/1945: Gravel tarmacadam.
B.S. 2040/1953: Gravel bitumen, macadam.
B.S. 1984/1953: Single-size gravel aggregates for roads (including surface dressing).

Asphalt, tarmacadam, and bitumen macadam with gravel aggregates are being increasingly used in many areas, due not only to their proven efficiency and lasting qualities but also to the saving in cost which they so often effect. In many areas gravel is the only locally produced stone and these coated products can therefore be supplied more economically than similar products made with crushed rock aggregates imported from a distance.

For surface dressing, also, gravel "shingle" is usually the cheapest and most readily available material, and with modern methods of application gives most satisfactory and lasting results. It is favoured also from the point of view of road safety; its non-skid properties are second to none and its lightness of colour gives the maximum reflective illumination from overhead lighting. An example of gravel surface dressing, at Angel Road Goods Yard, is shown in the illustration on page 364. In this district of London alone thousands of square yards are surfaced in this way.

Road surfacing and pavings are the subject of continual research and new techniques are being constantly developed. The S.A.G.A. is confident that sand and gravel aggregates will be increasingly required to meet the railways' needs in this field.

Gravel for Track Ballast

In the early days of railway construction gravel was commonly used as track ballast. In recent years, however, the use of gravel for this purpose has diminished, a fact which has undoubtedly increased the cost of this expensive item of maintenance.

It seems regrettable that locally produced gravel, which can be supplied in the required sizes, should not be more generally used where it is handy and so save the haulage costs on carrying crushed rock, often from considerable distances. Enquiries made by the S.A.G.A. Technical Committee have revealed that gravel is used extensively for track ballast in Holland, Switzerland, and the U.S.A. It is suggested that this subject might provide a fruitful field for discussion between the two industries and might well result in substantial economies to the railways. The illustration on page 365 shows an example of the satisfactory use of gravel for this purpose in the Isle of Wight.

Miscellaneous Uses of Sand

There are several miscellaneous uses of sand by the railways which, although of little significance individually, together add up to a considerable quantity each year. Among these are the sanding of rails in frosty weather, sand tracks on inclines where the grading is steep, and the blanketting of fires. These and others are necessary if unspectacular railway requirements which the sand and gravel industry supplies.

S.A.G.A. Service

The S.A.G.A. Technical Committee, to which reference has already been made, is responsible for research, for representing the industry on British Standards Committees, for liaison with Government departments and other trades associations, and generally investigating all technical aspects of sand and gravel and the products of which they form the main constituents. This committee, by means of its publications, courses, and other activities is active in assisting members to overcome production difficulties and improve the standard of their products. It is equally ready and anxious to help the user interests in securing the materials they want and the best results from them.

SPECIAL ROOFING AND SMOKE CHUTES FOR PETERBOROUGH REPAIR SHED.—The recently completed repair shed at Peterborough New England Motive Power Depot, Eastern Region, is a twin-bay, steel-frame building designed by Mr. A. K. Terris, Chief Civil Engineer of the Region. Both bays are 296 ft. long, one with a span of 40 ft. and the other 31 ft. Special asbestos cement smoke chutes were designed in conjunction with the Universal Asbestos Manufacturing Co. Ltd. The asbestos cement roofing is a combination of Universal Troughing crown units with Trofsec sheeting and roof lights on the pitched portions, the asbestos cement being treated with a vinyl acid-resisting paint as a precaution to meet the severe conditions of sulphurous fumes. The general contractors were R. F. Herron Limited, Ruislip.

I.C.I. AT THE B.I.F., 1957.—Metal and plastic product developed by Imperial Chemical Industries Limited will be displayed on the company's two stands at the 1957 British Industries Fair. Road, rail, air and marine transport applications of the Metal Division's alloys will all be illustrated. These include Kynal aluminium alloy extrusions for structural work; small-diameter copper tubing in soft-temper coils for instrumentation, fuel and lubrication pipes; condenser tubes and plates; and Kynal sheet, treadplate and chequerplate for panelling, catwalks and superstructures.

SWITCHGEAR & COWANS LIMITED DIVIDEND.—A final dividend of 15 per cent is recommended for Switchgear & Cowans Limited, as forecast at the time of the two-for-seven rights issue. An interim ordinary dividend of 10 per cent was paid before the issue. For 1955, a 25 per cent dividend was paid on the smaller capital. Net profits were £54,604 (£56,098) after depreciation of £44,422 (£38,439) and tax of £86,725 (£83,475). The dividend takes £29,469 (£25,156) and general reserve £20,000 (nil), leaving £112,060 (£106,925) to be carried forward.

LONDONDERRY & LOUGH SWILLY RAILWAY RESULTS.—At the annual meeting of the Londonderry & Lough Swilly Railway Company in Londonderry on March 15, Sir Basil McFarland, the Chairman, stated that they were more fortunate than most other public transport concerns in the country: they stood on their own feet, they were independent, they balanced their income and expenditure and they intended to continue to work in the interest of the company and the area they served. Receipts from passenger services rose from £144,986 in 1955 to £146,846 in 1956. Receipts from goods transport showed a serious drop from £118,343 in 1955 to £104,133 last year, a decline of £14,210. The total gross traffic receipts for road transport amounted to £250,979, a decrease of £12,350. Expenditure under all heads amounted to £242,506 for 1956, a decrease of £14,230 and the final net result showed an improvement from £8,304 in 1955 to £11,170 last year. The company operates road services only.

WESTINGHOUSE EXHIBITS AT BRITISH INDUSTRIES FAIR, 1957.—A section of the Westinghouse Brake & Signal Co. Ltd. stand for this year is devoted to the company's activities in the pneumatic control equipment field. Another exhibit demonstrates the power and sensitivity of the Pneudyne positioner. This positioner has a wide variety of applications ranging from fluid coupling or engine fuel rack control to large boiler flue damper operation. A static exhibit of an electro-pneumatic Control Desk for a pit-top decking layout with mine car traverser circuit will be shown to illustrate mining equipment developments and a comprehensive display of Westinghouse rectifier equipments of the latest designs for plating and other industrial purposes will also be exhibited.

New Carriage and Wagon School at Derby

Workshop converted for training three annual intakes of 30 apprentices

Turning and machining section

AS part of the British Railways, London Midland Region, scheme to provide efficient training establishments at all their main works, a new training school was opened at Derby Carriage & Wagon Works, on March 19, as reported in our issue of March 22.

The training school has been converted from an old two-storey building formerly used as a workshop for the Outdoor Machinery Services. An interim scheme was introduced in 1951 which provided for training facilities on a limited scale on the first floor only, but encouraged by the success of this venture, authority was subsequently given for the whole building to be adapted, and for the installation of additional machinery, plant and equipment. It has thus been made possible for all apprentices employed in the works to pass through the school during the first year of their service.

Converted Building

The building occupies a prominent position adjacent to the main works, ensuring close contact between the training school and the various workshops, and introduces a true workshop atmosphere into the school. The ground floor contains the main workshop, Chief Instructor's office, Instructors' room, Secretary's office, reception room, and a complete amenities block. On the first floor are additional workshop sections, two lecture rooms, each with a seating capacity for 20 trainees, and a cinematograph projection room. Store rooms are located on both floors of the building. One of the lecture rooms is fitted with a science desk to facilitate practical demonstrations and experimental work. Physical education will be undertaken in a nearby works gymnasium. The total floor space of the training school is approximately 12,000 sq. ft. and accommodation is available for 90 apprentice trainees at any time.

The main work was carried out by the Building Department, Derby Carriage & Wagon Works.

Intakes of apprentice trainees will conform to the leaving dates of the schools in the Derby area and will be three per annum. Accordingly, one third of the total annual requirements will be started each school term. The training scheme will give preliminary practical and theoretical instruction to all apprentices upon engagement at the age of 15 for one whole year. Approximately two thirds of the time in the school will be spent on practial work and the remainder on theoretical work.

Curriculum

The practical work is divided into five main sections: (1) Fitting and assembly, electrical work; (2) turning and machining, smithing, forging; (3) sheet metal work, oxy-acetylene and electric welding; (4) coach bodymaking and finishing, wagon building, wood machining, joinery; (5) painting, French polishing, coach trimming. Each section operates under the supervision of a competent workshop instructor and approximately 27 hr. a week are spent in the school workshop on practical work.

The main items of workshop equipment are centre lathes, capstan lathe, wood-turning lathe, woodworking lathe, sensitive drilling machine, shaping machine, grinding machines, bench folder, universal cramp folding machine, guillotine, plate shearing machine, fly press, plate rolling machine, marking-out table, levelling block, three-operator electric welding machine, oxy-acetylene welding sets, electrical wiring panels, smiths' hearth and anvils, and numerous benches and

(*Continued on page* 368)

Engineering drawing lesson in progress

Grimsby Central Market Goods Depot Modernised

Slat conveyor and closed loop capstan

Slat conveyor moving goods to cartage vehicles

THE modernised Central Market Goods Depot at Grimsby, Eastern Region, deals with some 50 wagons of miscellaneous consignments daily. The new equipment and layout will enable the traffic to be handled in a steady flow.

Equipment provided includes a slat conveyor, 3 ft. wide, running the length of the shed, which operates at a speed of 30 ft. per min., a closed loop capstan for the movement of wagons to and from the unloading point on the conveyor line; ten additional trailers for stand loading and a battery-electric tractor for the movement of trailers within the depot. The new shed layout enables 24 trailers or vehicles to be loaded. The shed front has been opened up to provide a loading bench 4 ft. in width between the conveyor and the cartage berths which accommodates 22 vehicles in addition to an existing bay which has standing-room for two road vehicles.

The shed alterations which have been carried out and the new equipment installed are designed to allow direct loading from rail wagon to the cartage vehicles, positioned in delivery round order, via the slat conveyor. As rail wagons are emptied further loaded wagons are moved into position at the off loading point on the conveyor by the closed loop capstan. Goods conveyed from the rail wagons by the conveyor will be taken off by the staff when they reach the appropriate cartage delivery vehicles thus eliminating barrowing and sorting. Transhipment traffic will be loaded from the conveyor to a trailer reserved for internal movement which will be perambulated by the battery-electric tractor to rail wagons for onward transmission.

Improved Amenities

Other improvements made in the shed include the provision of a new lock-up for vulnerable traffic, checkers and timekeepers' offices and improved amenities for the staff. Cold cathode type electric lighting has been installed in the shed over the conveyor and cartage bays and filament lighting on the shed front over the closed loop capstan and in the offices.

Grimsby Central Market Goods Depot is over 100 years old and before the last war handled the bulk of Grimsby's freight traffic, both inward and outward. Since the war outward traffic from Grimsby has been dealt with at Pasture Street depot, leaving the Central Market depot free to concentrate on the handling of incoming consignments for distribution in the Grimsby area.

New Carriage and Wagon School at Derby

(*Concluded from page* 367)

hand tools appropriate to the various crafts.

In planning the curriculum for the theoretical work, care has been taken where possible to draw up a course which is complementary to the National Certificate courses and City and Guilds of London Institute courses. Provision is made for instruction in workshop mathematics, workshop science, free-hand sketching and machine drawing, industrial history, workshop theory, industrial geography, individual expression, and first aid. In all, 12 hr. each week are spent in the lecture rooms on theoretical work.

At the termination of the 12 months course in the training school, the apprentice trainees will be transferred to the works and their training will be continued up to the age of 21 years. The training will follow a carefully planned schedule which guarantees every apprentice being given the same opportunity in accordance with the principles of the progressive system of workshop training which operates throughout the works.

Similar schools are already operating at the Crewe and Derby Locomotive Works, and at the Earlestown and Wolverton Carriage & Wagon Works of the London Midland Region.

BRITISH STANDARD FOR ELECTRICAL APPARATUS.—Frequently, electrical apparatus constructed to comply with different British Standards may be grouped at the same location and, where the same type of enclosure is appropriate or is specified by the purchaser, it is desirable that the same requirements should apply to each enclosure. Hitherto the requirements have been given in several different British Standards; in some cases quite unnecessary divergences have existed. To remedy this, the various requirements regarding types of enclosure have been reviewed and brought together in a new British Standard B.S. 2817, 1957. This publication provides standard definitions and requirements for all the kinds of enclosure which are in common use throughout the electrical industry, e.g. open types, protected type, totally-enclosed and drip-proof, and so on. The standard applies to all types of apparatus unless an alternative definition or requirement is considered necessary to meet conditions peculiar to a particular application, e.g. flameproof equipment for use in flammable atmospheres. In such special cases reference should be made to the appropriate British Standard (e.g. B.S. 229 for flameproof enclosures). The standard is in two parts. Copies may be obtained from Sales Branch, British Standards Institution, 2, Park Street, W.1. Price 3s. net.

L.M. REGION MOBILE BUREAU.—The London Midland Region of British Railways has sent out on tour a mobile enquiry bureau to advertise North Wales for holidays in the principal cities and towns of the Midlands. Besides information about train services and fares, details of accommodation and the usual holiday attractions, the two men in charge in the Bureau, who are experts in the Welsh language and lore, will emphasise some unique facilities, which include a radio cruise train and a land cruise train which daily take passengers through the best scenery of the district. They will also mention weekly runabout tickets and visits at Holyhead to the packet steamers on the Holyhead-Dun Laoghaire service.

RAILWAY NEWS SECTION

PERSONAL

The Gold Medal of the Institution of Locomotive Engineers has been awarded to Sir William A. Stanier for outstanding and meritorious service in the advancement of locomotive engineering.

The Rt. Hon. A. R. W. Low has been appointed a director of the General Electric Co. Ltd.

Mr. G. Pande
Chairman, Indian Railway Board, 1954-57

Mr. P. C. Mukerjee
Appointed Chairman of the Indian Railway Board

Mr. G. Pande, Chairman of the Indian Railway Board, who, as recorded in our March 15 issue, has retired, has completed over 31 years of railway service. Mr. Pande was born on January 1, 1902, and educated at Muir Central College (Allahabad University) and the Thomason Civil Engineering College, Roorkee, where he won the Council of India prize and Butler Trophy. He became an apprentice engineer on the former East Indian Railway in 1925 and, the following year, was appointed Assistant Executive Engineer. Between 1927 and 1928 he served on the Rikhkesh-Karanprayag railway survey, and, in 1929, became Assistant Executive Engineer, Open Lines. Mr. Pande was appointed Superintendent, Way & Works, Allahabad, Moradabad and Dinapore, in 1940; Personnel Officer (Senior Scale), Asanol and Headquarters Office, in 1942; Executive Engineer, Construction & Doubling, in 1944; and Deputy General Manager (Planning) in 1946. Between 1947 and 1948 he was Joint Director, and, later, Director, Civil Engineering, Railway Board. In 1948 he was appointed Divisional Superintendent, Dinapore, East Indian Railway, and, later in the same year, Engineer-in-Chief, Ganga Bridge, Mokameh. He served again as Director, Civil Engineering, Railway Board, from 1949 to 1950, when he was appointed General Manager of the Oudh Tirhut Railway. In 1952 he was appointed General Manager, North Eastern Railway, and in 1954, Chairman, Indian Railway Board.

Mr. P. C. Mukerjee, M.A. (Cantab.), M.I.E. (Ind.), who, as recorded in our March 15 issue, has been appointed Chairman of the Indian Railway Board, was born on October 30, 1904, and educated at Calcutta and Clare College, Cambridge. He began his career at the age of 21 as Assistant Engineer with the former East Indian Railway on November 26, 1925, and subsequently became Assistant Superintendent (Staff), Employment Officer, Executive Engineer, and Personnel Officer (Senior Scale). During the war his services were requisitioned for the Department of Munitions Production, where he successively held the positions of Deputy Director, Director (Civil Engineering), and Deputy Director-General (Engineering). In 1946 he became Controller of Railway Supplies with the Railway Board: he was also Deputy Director-General (Development) with the Indian Government Industries & Supplies Department. Mr. Mukerjee returned to the East Indian Railway in 1947 as Deputy General Manager (Works), and, after a brief period of service as Divisional Superintendent, was appointed General Manager of the Bengal Nagpur Railway in April, 1948. In 1949 he became the first General Manager of the Indian Railways Locomotive Works at Chittaranjan, a project with which he was connected from its inception. During his last year at Chittaranjan he also worked as a member of the Defence Ministry's Ordnance Factories Reorganisation Committee. Mr. Mukerjee was appointed General Manager of the Eastern Railway early in 1954, and, later the same year, became a Member of the Indian Railway Board.

The following changes in directorships of Tilling Group omnibus companies have been approved by the British Transport Commission:—

Mr. J. S. Gavin to be Chairman of Cumberland Motor Services Limited, in succession to Mr. F. P. Arnold.

Mr. C. H. S. Pickett to be Chairman of the Southern National and the Western National Omnibus Companies Ltd., in succession to Mr. S. Kennedy.

Mr. M. Holmes to be Chairman of Red & White Services Limited, United Welsh Services Limited, and the Thames Valley Traction Co. Ltd., in succession to Mr. S. Kennedy.

Mr. M. Holmes has also been appointed to fill the vacancies created by the above changes on the boards of Cumberland Motor Services and of the Southern and Western National companies. The positions

Mr. H. E. R. Bastin

Appointed District Commercial Manager, Bristol, Western Region

Mr. C. T. Rogers

Appointed Assistant Public Relations & Publicity Officer, Western Region

Mr. A. Jessop

Chief Assistant (Sales) to Chief Commercial Manager, L.M. Region

of Mr. S. Kennedy as Chairman and of Mr. F. P. Arnold as a Member of the Tilling Group Management Board, also their appointments to the boards of other companies within the Tilling Group, are not affected by these changes.

Mr. H. E. R. Bastin, who, as recorded in our March 18 issue, has been appointed District Commercial Manager, Bristol, Western Region, British Railways, joined the service of the Great Western Railway in 1917 in the office of the Chief Goods Manager at Paddington. In 1930 he was appointed Personal Clerk to the Assistant Chief Goods Manager & Development Agent, a position he occupied until 1933 when he took over an appointment in the Station Working Section of the Department, becoming, in 1938, an Outdoor Investigator. Early in 1939 he took charge of the Emergency section set up to prepare various emergency schemes preparatory to the outbreak of the 1939-45 war, which Section was merged, in 1941, with the Station Working Section. He was placed in charge of this work, being responsible for all Goods Terminal matters. He represented the Great Western Railway on Ministry of Food and Ministry of Supply liaison committees, and served on various other committees at headquarters dealing with wartime emergency matters. In 1944 he was also appointed Secretary of the Goods Stations Modernisation Committee and, in 1945, was promoted to be Assistant Goods Agent at Bristol. Mr. Bastin became Assistant Goods Superintendent at Paddington in 1946 and, in December of the following year, was appointed Goods Agent at South Lambeth, relinquishing this position in May, 1950, to become Terminals Assistant to the Commercial Superintendent of the Eastern Region at Liverpool Street. He was a member of the Eastern Region Sectional Council No. 4 and represented that Region on the Goods & Parcels Terminals Committee principally engaged in modernisation and mechanisation of Goods & Parcels depots and the development of throughout rail transport of palletised traffic. He returned to the Western Region in July, 1954, as District Commercial Manager at Cardiff, the position he now vacates. Mr. Bastin is a member of the Institute of Transport and is at present Senior Vice-Chairman of the South Wales & Monmouthshire Section of that body.

Mr. C. T. Rogers, who, as recorded in our March 22 issue, has been appointed Assistant Public Relations & Publicity Officer, Western Region, British Railways, Paddington, was educated at Archbishop Holgate's School, York. Mr. Rogers entered the railway service in 1923 in the office of the L.N.E.R. Hotels Superintendent and subsequently gained experience in various departments including those of the Civil Engineer, Locomotive Running Superintendent, Passenger Manager, and Goods Manager. In 1936 he joined the L.N.E.R. Advertising Manager's Department at York, where, the following year, he became Head of the Press Advertising Section and, in 1940, Head of the Production Section. From 1941 to 1945, he was in Fighter Command, R.A.F. On demobilisation he was appointed Chief Clerk & Head of Production in the Scottish Area Advertising Manager's Office in Edinburgh. He returned to York in 1947 as Head of Press Advertising and, in 1949, became Head of the Outdoor & Display Section, Public Relations & Publicity Department, York. In August, 1955, Mr. Rogers was appointed Publicity Assistant to the Public Relations & Publicity Officer, Western Region, Paddington, the position he now vacates.

Mr. Arthur Jessop, M.Inst.T., who, as recorded in our March 22 issue, has been appointed Chief Assistant (Sales) to the Chief Commercial Manager, London Midland Region, British Railways, began his career in the former Lancashire & Yorkshire Railway in 1918. He served at various stations in Lancashire before being transferred to the office of the Superintendent of the Line in Manchester. After amalgamation he was transferred in 1925 to the General Superintendent's Office, Derby, and, in 1929, to London. Subsequently he was engaged as Assistant (Outdoor) in connection with the road and air transport interests of the L.M.S.R. and on other special matters. Mr. Jessop was a director of the Lincolnshire Road Car Co. Ltd., Hebble Motor Services Limited, the West Yorkshire Road Car Company, Yorkshire Traction Co. Ltd. Yorkshire (W.D.) Transport Company, and E. G. Oldham Ltd. He was a member of the Management Committee of the Eastern National Omnibus Company and of the Corporation & Railways Joint Omnibus Committees at Halifax, Huddersfield, Sheffield, and Todmorden. Mr. Jessop became Assistant to the Chief Commercial Manager in 1948 and was concerned with the commercial aspects of road transport, trade advertising, development of amenities and equipment of passenger stations and electrification schemes, including passenger planning in the London Area, and was Chairman of the Branch Line Committee for the London Midland Region. During the early years of nationalisation he worked on the co-ordination of the various forms of transport, being in alternate years Chairman of the Traffic Integration Committee of the British Transport Commission on which the Railway, Road Transport and Docks & Inland Waterways Executives were represented. In 1953 he was seconded by the B.T.C. to act as Transport Adviser to the Government of Mauritius. Subsequently after visiting South Africa, Canada, and the United States, he was further seconded to make a report on Transport for the Government of Trinidad and Tobago, finally returning to the United Kingdom in April, 1956.

Mr. A. W. McMurdo, District Engineer, Shrewsbury, Western Region, British Railways, has been appointed District Engineer, Wolverhampton.

Dr. L. J. Haydon, Medical Officer, Southern Region, British Railways, has been invited by the Chairman of the Medical Surgical Section of the Association of American Railroads to attend the annual Convention of that body at White Sulphur Springs, West Virginia, at which he will read a paper on railway medicine in Great Britain.

Messrs. Merz & McLellan announce that they are taking into partnership, with effect from April 1, 1957, Mr. W. W. Campbell and Mr. A. W. Pedder, who have been senior members of their staff for a number of years. Mr. Campbell will normally be based on the firm's Newcastle office and

Mr. Pedder on its Esher office. As from the same date Mr. T. G. N. Haldane is retiring from partnership as he wishes to devote an appreciable amount of time to his private interests in Scotland. He has agreed to continue his connection with the firm as a Consultant.

The following administrative changes have been announced by Sudan Railways:—

Sayed Mohamed El Fadl, Chief Engineer, becomes General Manager, succeeding Mr. J. R. Farquharson.

Sayed Abdalla Masoud, Traffic Manager, has been appointed Deputy General Manager, succeeding Sayed N. K. Misra, who, as recently recorded, has been appointed Special Duty Officer, Minister of Communications' Office, Khartoum. Sayed Masoud is succeeded as Traffic Manager by Sayed Izzel Din Mohamed, who is succeeded as Assistant Traffic Manager by Sayed Ismail Hussein, Commercial Superintendent.

Sayed Abu Bakr Ali Rida has been appointed Chief Engineer. He is succeeded as Assistant Chief Engineer by Sayed Yousif Mohamed Sukkar, Maintenance Engineer.

The following staff changes have been announced by the London Midland Region of British Railways:—

Mr. J. C. V. Thompson to be Assistant to District Engineer, Manchester.

Mr. S. R. Crunkhorn to be Staff Assistant to Divisional Operating Superintendent, Manchester.

Mr. H. H. Mason to be District Motive Power Superintendent, Carnforth.

Mr. S. L. F. Allen to be Assistant to District Commercial Manager (Passenger), Leicester D.C.M.O.

Mr. J. H. Capstick to be Assistant to District Operating Superintendent, D.O.S.O., Derby.

Mr. L. Lloyd to be Assistant to District Operating Superintendent, Manchester London Road (E.O.A.).

Mr. H. Amos to be Assistant to District Operating Superintendent, Nottingham Victoria (Eastern Operating Area).

Mr. R. W. Harrison to be Assistant to District Commercial Manager (Goods), Derby.

Mr. K. N. Sidebotham to be Assistant District Passenger Manager (Sales), D.P.M.O., Manchester.

Mr. F. J. W. Wagstaff to be Assistant District Passenger Manager (Sales), D.P.M.O., Euston.

Mr. T. Williams to be Assistant District Goods Manager (Sales), D.G.M.O., Liverpool.

Mr. M. H. Matthews to be Assistant District Commercial Manager (Sales), D.C.M.O., Derby.

Mr. H. Pilling to be Estate Accountant, Euston.

Mr. J. J. Maguire to be Valuer, Estate & Rating Department, Euston.

Mr. F. G. Clarke to be Assistant District Motive Power Superintendent, Derby.

Mr. J. Trainer to be Assistant District Motive Power Superintendent, Toton.

Mr. A. S. Lowe to be Assistant Outdoor Carriage & Wagon Engineer, Derby H.Q.

Mr. A. Pygott to be Goods Agent, Manchester, Ancoats.

Mr. C. J. Beeston to be Goods Agent, Stoke-on-Trent.

Mr. A. D. K. Addy, Chief Engineer's Office, Nigerian Railways, has been elected an Associate Member of the Institution of Civil Engineers.

Mr. Brian A. C. Whitmee has been appointed a director of the Central Wagon Co. Ltd.

Mr. E. A. Cooke has been appointed Scientific Engineer to the Sheepbridge Group.

The Plessey Co. Ltd. has announced the appointment of Mr. F. C. Loughborough as Executive Assistant (Sales) to the group Director, Mr. John A. Clark.

Dr. J. W. Bondi, Brigadier L. Bootle-Wilbraham, and Mr. G. H. Diggens have been appointed directors of Brush Export Limited. Mr. Diggens has also been appointed a director of National Oil Engines (Export) Limited.

The Metropolitan-Vickers Electrical Co. Ltd. has announced the appointment of Mr. E. H. Beech as Superintendent, Foundries & Pattern Shop, in succession to Mr. A. Phillips, who remains with the company in an advisory capacity.

Mr. G. E. Liardet, Chairman & Managing Director of Simms Motor Units Limited, was the recipient of an antique grandfather clock made by Moonier in 1810, a set of crystal wine glasses, and an illuminated address at a private dinner recently given at the Belfry Restaurant by the directors and executives of the company, to celebrate his 25 years of service.

INSTITUTION OF LOCOMOTIVE ENGINEERS.

The following elections have been announced by the Institution of Locomotive Engineers:—

Associate Members

Mr. G. Hulme, Inspecting Engineer, c/o E. D. Westlake, Esq., 24, Madison Avenue, Cheadle Hulme, Cheshire.

Mr. J. Lindley, Inspecting Engineer, Crown Agents for Oversea Governments & Administrations.

Mr. B. B. Rackstraw, Development Engineer (Railcars), Rolls-Royce Limited.

Mr. A. E. Simmons, Assistant (Diesel) to Motive Power Superintendent, Eastern Region, British Railways.

Mr. R. J. Smith, Plant Engineer, British Railways Carriage & Wagon Works, Doncaster.

Reinstated as Associate Member

Mr. R. D. Gardiner, Assistant Divisional Motive Power Superintendent, British Railways, Derby.

Associate

Mr. T. H. Stephenson, Director, Thos. Turton & Sons Limited.

Graduates

Mr. J. R. Brett, Engineer Apprentice, Eastleigh, Southern Region, British Railways.

Mr. G. D. Dunkel, Graduate Engineer, Eastleigh, Southern Region, British Railways.

Mr. G. E. Hanks, Assistant to District Motive Power Superintendent, Western Region, British Railways.

Mr. A. Swain, Locomotive Fitter (Grade 1), Motive Power Department, London Midland Region, British Railways.

Mr. P. J. A. Williams, Junior Engineer, Traction Motor Design Department, General Electric Company Limited.

Transfers Associate Member to Member

Mr. J. K. Lord, Electric Traction Engineer, Eastern and North-Eastern Regions, British Railways.

Mr. J. S. P. Phillips, Assistant Works Manager, Nigerian Railway.

Mr. M. F. J. Wright has been appointed Advertising Manager of Black & Decker Limited.

We regret to record the death on March 8 of Mr. Leigh Ollerenshaw, Managing Director of the Railway Signal Co. Ltd.

Mr. F. Andrew Field, Homes Sales Manager of Black & Decker Limited since 1953, is leaving the company at the end of this month to become Managing Director of the Eutectic Welding Alloys Co. Ltd.

Mr. Peter Salmon, Director & Production Manager of the Expanded Metal Co. Ltd. and Mr. Edgar Prentice, General Sales Manager, are leaving the United Kingdom early in April on an extensive tour of Canada and the United States, to study techniques of production and sales in those countries.

Mr. J. L. Bernard has been appointed Director & Secretary of the British Electrical Development Association, succeeding Mr. V. W. Dale, who is resigning for reasons of ill-health. The appointment takes effect from April 1. Mr. Dale will continue to be associated with the E.D.A. until July 1 to conclude existing commitments. Mr. Bernard joined the staff of the organisation in 1928 and has been its Chief Technical Officer since 1936.

C.I.M.A.C.

The office of the Permanent Committee of the International Congress of Combustion Engines (C.I.M.A.C.) comprises the following members:—

Chairman

Mr. P. C. Tharlet (France).

Vice-Chairmen

Mr. W. K. G. Allen (Great Britain); Mr. H. Andresen (Denmark); Mr. A. Bourlet (Belgium); Mr. R. De Pieri (Italy); Dr. E. Sörensen (Germany).

Delegates by right

Dr. W. J. Müller (Netherlands); Mr. M. Zwicky (Switzerland).

General Secretary

J. Croguennec, Paris.

INSTITUTE OF TRANSPORT

The following elections have been announced by the Institute of Transport:—

Vice-Presidents

Mr. H. Leslie Bowes, Managing Director, Pacific Steam Navigation Company.

Mr. David Blee, General Manager, London Midland Region, British Railways.

Mr. J. B. Burnell, Operating Manager (Central Road Services), London Transport Executive.

Mr. E. R. L. Fitzpayne, General Manager, Glasgow Corporation Transport.

Mr. A. G. Marsden, Transport Adviser to the Board of Unilever Limited.

Major-General G. N. Russell, C.B., C.B.E., General Manager & Chairman of the Management Board, British Road Services.

Hon. Treasurer

Mr. D. McKenna, Assistant General Manager, Southern Region, British Railways.

Hon. Librarian

Mr. C. H. S. Pickett, Member, Tilling Group Management Board.

The following have been elected Additional Ordinary Members of Council for the year 1957-58:—

Marshal of the Royal Air Force, the Rt. Hon. Lord Douglas of Kirtleside, Chairman, British European Airways Corporation.

Sir Brian Robertson, Chairman, British Transport Commission.

NEW EQUIPMENT AND PROCESSES

Portable Testing Set for Vacuum Braked Vehicles

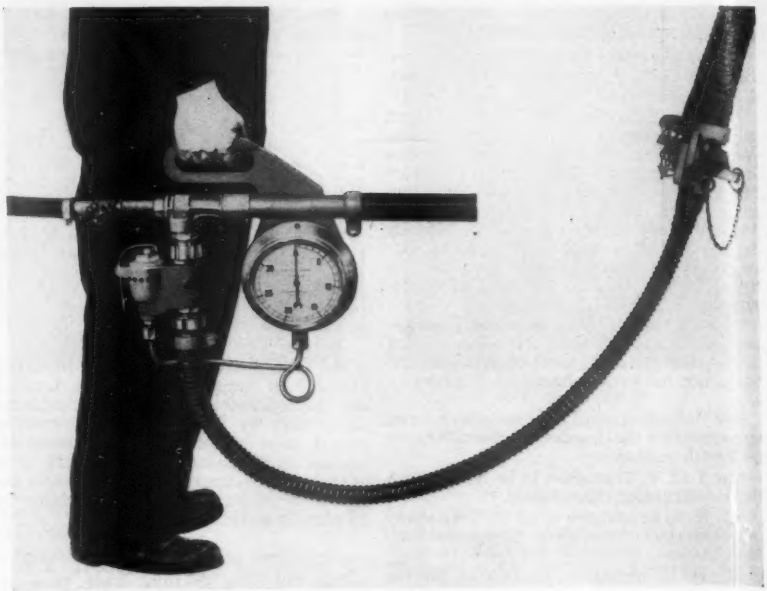
THE testing of the brake systems of new or reconditioned railway vehicles fitted with vacuum brakes at works which, while not possessing a vacuum main for this purpose, have normal supplies of compressed air, is achieved by the Gresham Testing Set.

This unit is air-operated, provides a source of vacuum and suitable control for testing individual vehicles approaching completion, and is compact and self-contained. Weighing only 34 lb. it can be handled easily by one man as seen in the illustration.

The unit is fed by a standard ½-in. flexible compressed air hose which can be connected to any convenient branch on the compressed air main. An air operated ejector is used to obtain the desired vacuum whilst rubber seated isolating and application valves controlled by one lever enable the operator to carry out the specified tests. A 6-in. vacuum gauge is incorporated in the device to register brake pipe conditions and a long flexible hose is provided complete with 2-in. coupling for attachment to the end hose on the vehicle to be tested.

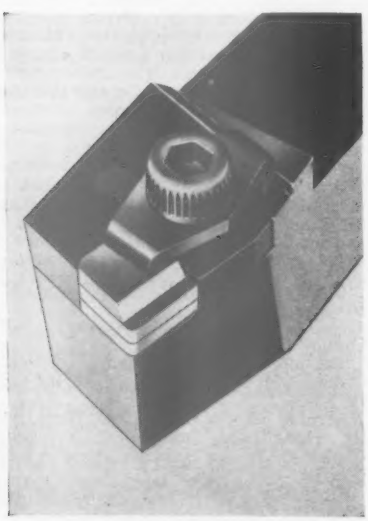
Full instructions are issued by the makers with each testing set outlining the method of operation and suggested test procedure. It is pointed out that this unit is only suitable for single vehicles. Larger electrically driven portable exhauster sets are available for testing rakes of vehicles.

Price and delivery details are available on application to the manufacturer, Gresham & Craven Limited, 15, Whitehall, London, S.W.1.



Throwaway Tip Tools

THE principle of using tips which may be discarded at the end of their useful life is embodied in the range of Wimet Econotip tools. Designed on the already known principle of clamped tip tools, they consist of a holder to which a carbide tip and a separate chip curler are fixed in a prepared location, which eliminates the need for tool re-servicing. As each cutting edge becomes work-dulled, the tip is released and turned round or over to present a new sharp cutting edge, until the eight edges on the square tip or the six edges on the triangular tip have been used, when the old tip is simply thrown away and a new tip inserted.



Advantages are stated to include the elimination of the expense of re-grinding or lapping process and the removal of risk of tool failure and shortened life due to incorrect grinding. Also time for re-setting tools is reduced because tool settings remain undisturbed.

The Econotip holder is made from toughened high carbon steel, and has a seating for the carbide tip and a chip curler provided by a locating piece dowelled to the holder. These are secured to the holder by a clamp and socket screw. The seating for the tip and chip curler is designed to accommodate two tips, the lower tip acting as an anvil for the cutting tip and as a wear resistant face immediately below the tip. When a chip curler is not required, the tips can be secured by reversing the clamp. The tip seating is arranged to give a 5-deg. negative cutting rake and the normal 5-deg. front to back angle. Four styles of tip are available, giving approach angles of 15, 30, or 45 deg. with the square tip, and zero deg. approach angle with the triangular tip. Two grades of carbide are available at present, Wimet grade N for machining cast iron, non-ferrous and general purpose cutting and Wimet grade XL2 for cutting steel at high speeds.

Complete tools in the utility range can be supplied from £1 16s. 9d. each, and replacement tips at 3s. 9d. each. The manufacturer is Wickman Limited, Wimet Division, Torrington Avenue, Coventry.

Compact Spraying Set

THE Monoblock Compressor 2½ illustrated is a small, portable, electrically-operated air compressor and can deliver air up to 50 p.s.i. Its main application to railways appears to be when used in conjunction with a spray gun, for spray painting. Uses include small-scale decoration of station exteriors, waiting rooms, and retouching road vehicle paintwork and so on.

Stated to be economical in use, it has no belts or couplings to necessitate frequent adjustment or maintenance. Because the electric motor is of the capacitor type, the electricity consumption is low enough to enable it to be operated from a normal domestic type supply point.

The compressor has an air-cooled compressing cylinder; the bore is 2½ in. and stroke ⅛ in. Displacement is 2½ c.f.m. at

1,400 r.p.m. and maximum working pressure is a continuous 40-50 p.s.i. and intermittently up to 100 p.s.i.; the built-in electric motor is single phase, 220-240 V., 50 cycles. The compressor is fitted with oil and water separator, pressure gauge, safety valve adjustable to required pressures, drain cock and air cock, and has a patented forced lubrication of the gudgeon pin bearing. It weighs about 60 lb. and its overall dimensions are 12 in. × 10 in. × 13 in. For spray painting, the manufacturer has introduced an attachment, the Appinco M.B. spray gun, which is of the pressure-feed type, using the internal atomising principle. The gun works at comparatively low pressure using approximately 1·5 c.f.m. at 25 p.s.i. Three interchangeable nozzles are supplied.

The price of the complete plant, Appinco M.B. spray gun, with cable and hose, is £39 17s. 6d. The compressor only costs £31 17s. 6d. Delivery is two to three weeks. The manufacturer is the Apparatus & Instrument Co. Ltd., Aico House, Vineyard Path, London, S.W.14.

Robust Loudspeaker Control Unit

A HEAVY-DUTY bulkhead microphone control unit, designed to meet the requirements of many factory plants where a high noise level makes the use of normal communication methods unsuitable, is of application to railway workshops, open-air stores compounds, marshalling yards, and so on.

A typical system consists of a central

amplifier of suitable power output, and a number of bulkhead microphone units, with associated loudspeakers, placed at key points throughout the plant. An operator wishing to make an announcement presses the red "call" button, which produces a warning note in all the loudspeakers in the network. He then presses the green "speak" button, and keeps it depressed, while broadcasting the message.

During the transmission of a message, the local loudspeaker is muted, or partially attenuated, to avoid feedback. On releasing the button the microphone station is ready, if necessary, to receive replies from other points similarly equipped, or further announcements, or warnings, from distant stations.

The bulkhead unit, which is known as the SH80, has a robust cast-metal housing and is weather-proof. A fine graded wire mesh protects the microphone against dirt and moisture. Portable versions of this equipment, which can be plugged in at strategic points, are also available.

Delivery of the SH80 control unit is ex stock. The price may be obtained on application to the manufacturer, Communication Systems Limited, Strowger House, 8, Arundel Street, London, W.C.2.

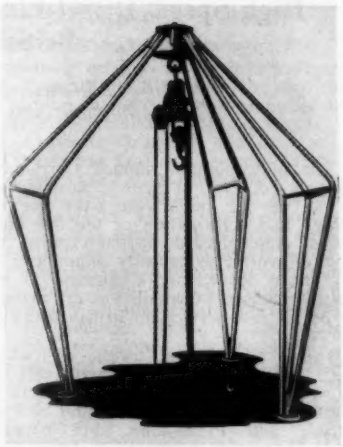
Adaptable Lifting System

THE Spyder System has been evolved as a result of an attempt to make a fresh approach to problems of raising and transporting heavy objects of considerable bulk, particularly where conventional methods are inadequate or non-existent.

The basis of the standard tripod, which has a working load of 2·5 tons, is a tubular space frame, and by means of interchangeable components can be quickly built up into an extensive yet easily altered overhead runway, to provide a mobile shop crane, to form a supporting unit to strengthen suspended floors and so on. The many applications of the system would include, for example, the lifting of items on site work in the absence of any permanent lifting arrangements.

The tripod consists of a crown plate which allows the legs to be arranged in five different radial positions to suit the object to be lifted, a keep plate to ensure the correct fitting of the legs which are made from light tubular steel and are of all-welded construction, to the crown, the two being retained by an eye bolt which also locates the lifting tackle. Feet of various forms to suit the ground or floor are supplied, and they are available if required with a ball joint for automatic levelling. The height under the eye bolt is 6 ft. 10 in.; height under gantry when fitted, 6 ft. 8 in.

The price for a standard tripod, complete, is £55 10s. Price range of other components and delivery details will be given on application to the manufacturer, Aldridge & Ranken Limited, Avonbank Works, Bath.



Trailer for Steel Plates

THE recently developed Wrigley 6-ton four-wheel trailer for use in handling and transporting steel plates is of application in the construction of boilers, steel wagons and so on.

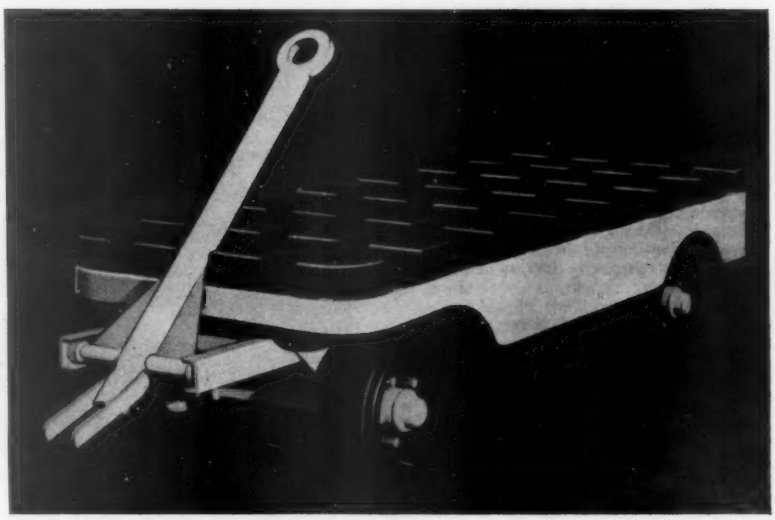
The specification follows the manufacturer's standard type model 62 which has an all-steel channel chassis and framework with a steel plate platform 8 ft. × 4 ft. or 12 ft. × 4 ft., although the sizes can be varied to suit individual requirements. It is provided with a welded steel plate skirt.

The platform is mounted on heavy steel axles with turntable steering. The heavy tubular towbar, with eye hitch, is fitted with a stop to prevent the tow-bar from falling to the ground.

The trailer is equipped with 15 × 6—11¼ industrial solid rubber tyre steel wheels, on five-stud taper roller bearing hubs.

Welded to the deck are rows of "stools" on which the steel plate load is placed flat. Chains or slings can then pass underneath the load, between the stools, thus enabling the load to be easily removed.

Price and delivery details are available from the manufacturer, Wessex Industries (Poole) Limited, Dolphin Works, West Street, Poole, Dorset.



High-Speed Diesel-Electric Pullman Expresses for British Railways

Air-conditioned, heat- and sound-insulated multiple-unit sets of integral construction

The Metropolitan-Cammell Carriage & Wagon Co. Ltd., of Saltley, Birmingham, is to be the main contractor for the design and construction of the five high-speed diesel-electric de-luxe trains, the first of which, as recently announced by Sir Brian Robertson, Chairman of the British Transport Commission, are planned to be put into service on British Railways in 1958.

These all-Pullman trains, in which meals will be served at all seats, will run between Manchester and St. Pancras in the London Midland Region; and between Bristol and Paddington, and between Wolverhampton, Birmingham, and Paddington in the Western Region.

First Class Only Sets

Two six-car trains, for first class passengers only, will be built for the Manchester-London service, while for the Western Region services three eight-car trains will be constructed with accommodation for first and second class passengers.

All the trains will be air-conditioned and be equipped with heat and sound insulation, the passenger portion of all vehicles being fully enclosed, with double-glazed windows.

Exterior Design and Decor

Special importance will be attached to the exterior styling of the trains and to the interior decor, and to advise them on these matters Metropolitan-Cammell, with the approval of the B.T.C. and the Pullman Car Co. Ltd., has appointed Mr. Jack Howe, F.R.I.B.A., F.S.I.A., as design consultant.

Integral Construction

The passenger portions of the vehicles, which will be of integral construction of steel, light alloy, or both, will be of open type, with seats arranged on either side of a central gangway—two seats on one side, one on the other.

The General Electric Co. Ltd. is the contractor for the auxiliary power equipment. There will be two power cars in a train, each with a machinery compartment containing a N.B.L./M.A.N. 1,000-h.p. pressure-charged vee 12-cylinder engine direct-coupled to a G.E.C. single-bearing main generator with belt-driven auxiliary generator.

Eight self-ventilated traction motors will be distributed through the vehicles of the train. The motors will be fully-spring-borne in the bogies and will be geared to the axles through Brown-Boveri spring drives. Cooling air will be supplied to the motors through ducting from protected intakes.

Control System

The control system will comprise a combination of main generator field control and engine speed variation, with automatic torque control through an oil servo-regulator. A range of several engine speeds will be provided by means of three air-operated pistons acting on the engine governor through a system of interconnected levers.

The Loudaphone system of telephone inter-communication between both the driver and guard will be installed in all the trains.

Diesel and Electric Drivers' Training School at Ashford

As recorded in our issue of March 15, a training school has been opened at Ashford, Kent, Southern Region, for the tuition of drivers for electric and diesel-electric trains, with at present particular reference to the Hastings-London six-car multiple diesel-electric sets shortly to be placed in service.

The accompanying illustration shows the interior of the lecture room, and a class receiving instruction on diesel-electric operation from one of the school staff.

Course of Instruction

At present the course consists of two weeks' classroom tuition followed by one week's practical training on one of the new diesel-electric sets, which is stationed near-by for this purpose. Printed notes of the details covered are issued, covering the general principles of C.I. engines and electrical transmission and control, and including a section of faults which might develop in service and the causes and remedies thereof.

The course of instruction ends with an oral and practical examination. At present top-link drivers are being trained, the men generally having obtained some experience of driving electric multiple-unit trains and diesel-electric shunting locomotives.

Recent Scottish and North Eastern Region Accelerations

Besides the new 60-min. services brought into operation recently with diesel train sets between Edinburgh Waverley and Glasgow Queen Street, there has recently been a considerable acceleration of the steam-hauled trains over the same line, the completion of certain engineering work having permitted the lifting of certain speed restrictions which have persisted for some years past. The accelerations per train range from 7 to 10 min., and the fastest time between the two cities has come down to 55 min. (by three trains); there are also one run in 58 min., and fourteen, all with one intermediate stop, at Haymarket, in 60 min.

From Glasgow there is now an express on the hour at hourly intervals from 8 a.m. to 6 p.m. inclusive, and at 8 and 10 p.m., with additional expresses at 7.30, 8.30, 10.30 and 11.30 a.m., and at 4.52, 7.30, 9.30 and 10.30 p.m. The 11 a.m. is the "Queen of Scots" Pullman, previously 10.43 a.m.; this express now leaves Edinburgh (Waverley) for the south at 12.5 p.m. instead of 12 noon, and is due in Kings Cross at 8.2 instead of 7.58 p.m., an acceleration of 13 min. overall. The 8.30 a.m. is the through Glasgow—Kings Cross ordinary service, which now waits at Edinburgh (Waverley) from 9.42 to 10.10 a.m. The 4 p.m. is the "North Briton," for which relief is given to Edinburgh by the new 3.52 p.m. service.

From Edinburgh there are express trains on the hour from 10 a.m. to 4 p.m. and also at 6, 8 and 11 p.m., with the 6.25, 7.40, 8.15, 8.30, 9.5 and 9.30 a.m., 1.50 p.m. ("North Briton"), 4.30, 5.15, 6.30, 7.30, and 10.20 p.m. The "North Briton" reaches Glasgow 9 min. earlier than before, at 2.51 p.m.; and the "Queen of Scots" (8 p.m. from Edinburgh) 10 min. earlier, at 8.55 p.m.

Another important Scottish alteration made during the currency of the winter service is the running in two parts throughout from Aberdeen to Kings Cross of the southbound "Aberdonian," except on

Class receiving instruction in diesel-electric operation, in the Southern Region diesel and electric drivers' training school at Ashford

Saturdays. The "Aberdonian" proper now leaves Aberdeen 15 min. earlier, at 6.55 p.m., and conveys sleeping car passengers only; it calls additionally at Kirkcaldy, and reaches Kings Cross at 7.3 instead of 7.16 a.m. The second part, leaving Aberdeen at the previous 7.10 p.m. and also calling at Kirkcaldy, is due at Kings Cross at 7.40 a.m. In the reverse direction there is now a 10.45 p.m. sleeping car train from Kings Cross to Edinburgh, additional to the 10.15 p.m. (all-sleeping car "Night Scotsman") and the 10.35 p.m.

In the North Eastern Region there has been a considerable acceleration of the Newcastle-Carlisle service since the introduction of diesel multiple-unit trains, only the heavier trains which are still worked by steam locomotives continuing to run in their old times. The 9.20 a.m. express from Newcastle to Carlisle arrives at 10.47 a.m., 13 min. earlier; the 6.20 p.m. at 8.7 p.m., 11 min. earlier; and the 8.20 p.m. at 10.18 p.m., 15 min. earlier; and there is an additional 3.20 p.m., due Carlisle at 5.8 p.m.

Eastbound, the 6.40 a.m. from Carlisle starts at 6.55 a.m. and is accelerated 17 min.; the 10.43 a.m. leaves at 11 a.m. with unchanged Newcastle arrival; the 1 p.m. (previously 1.5) is accelerated 12 min. and the 2 p.m. 11 min.; while the 7 p.m. is speeded up by 25 min., reaching Newcastle at 8.30 p.m., and the 9 p.m. (previously 9.5) by 20 min. A number of these trains have had intermediate stops cut out, the stations concerned now being served by additional stopping diesel services. The frequent stopping trains between Newcastle and Hexham, all of which are now diesel-operated, have been speeded up by 7 to 10 min. each.

Staff and Labour Matters

Omnibus Industry Wage Claims

At a meeting of the National Council for the Omnibus Industry held in London on March 19, the trade unions presented claims for substantial wage increases together with alterations and improvements in working conditions.

The claims affect some 100,000 workpeople in the provincial bus industry employed by the private bus companies and B.T.C. controlled undertakings. The proceedings were adjourned to permit the employers' representatives to consider the claims.

N.U.R. Wage Claim Settled

Agreement was reached on March 22 between the B.T.C. and the N.U.R. on the union's claim for improved rates of pay for railway salaried and conciliation staff.

The union's original claim was for a 10 per cent increase and the Railway Staff National Tribunal, which had been asked to adjudicate, issued a majority report giving an increase of 3 per cent. The minority report expressed the view that something more than 3 per cent was justified. The N.U.R. rejected the majority award and sought a meeting with Sir Brian Robertson, Chairman of the Commission. After negotiations, which were spread over three days, an agreed statement was issued setting out the terms of the settlement.

This stated that the B.T.C. having considered the separate findings of the Railway Staff National Tribunal dated March 17, 1957, felt justified in meeting the representatives of the N.U.R. in a joint endeavour to find a solution of the difficult situation created. In making the settlement, account was taken of the growing productivity and efficiency of the railways in this country.

After assurances given by the unions in connection with wage agreements in 1951 and 1953 to assist in the increase of efficiency, and since the establishment of the British Railways Productivity Council in 1955, it was recognised that recently there had been a growing realisation among railway staff of the change in outlook needed to make railway modernisation a success, and an increasing willingness to accept the changes inherent in the new developments. This had had tangible results. Real increases in efficiency had been achieved with benefit to the industry, as a result of joint consultation in which the N.U.R. had co-operated at all levels. In particular during the last year, following acceptance of the principle of work study by the British Railways Productivity Council, a large number of work study schemes for improving efficiency—many with incentive bonuses attached—had been introduced, with the co-operation of the staff, in permanent way maintenance and many other fields. The development of further schemes was proceeding with increasing momentum.

The parties recognised that there were still a number of matters, bearing on increased productivity, under consideration by the British Railways Productivity Council, or under or awaiting discussion in the negotiating machinery, which had not yet been resolved; and, while it was appreciated that other unions were also concerned in some of these matters, the N.U.R. had declared itself prepared to continue to co-operate to the fullest possible extent in an endeavour to resolve them. As an example, the N.U.R. representatives informed the Commission that they were prepared to discuss jointly with all concerned, and as a matter of urgency, the possibility of making progress towards an agreement on the question of the manning of diesel and electric locomotives. The Commission emphasised the great difficulty it has in securing financial stability, and in stabilising charges, if wage claims are too frequent. This was fully appreciated by the N.U.R. It was recognised that exceptional factors outside the control both of the Commission and of the unions may require a special reconsideration of wage levels. Apart from such circumstances, it was felt that it would make for harmony within the industry if periodical reviews at agreed intervals of time could take place between the management and the unions, at which all factors affecting the remuneration and conditions of the staff could be brought under joint examination, in a spirit of mutual confidence and trust. The N.U.R. agreed to give formal and sympathetic consideration to this.

In the above context the Commission proposed and the N.U.R. agreed to accept that the rates of pay of all railway salaried and conciliation staff covered by the machinery of negotiation (other than footplate staff, whose rates have already been increased) are to be improved by 3 per cent with effect from November 26, 1956, to March 3, 1957, and as from March 4, 1957, the rates of pay of all railway salaried and conciliation staff, covered by the machinery of negotiation, are to be improved further so as to give an increase of 5 per cent (in substitution for the 3 per cent) on the basic rates of pay in operation before November 26, 1956. The agreement was advised forthwith to the A.S.L.E.F. and T.S.S.A. with a view to the conclusion of a joint agreement by all the parties affected.

Parliamentary Notes

British Transport Commission Bill

Various provisions of the British Transport Commission Bill were discussed on the Motion for its Second Reading in the House of Commons on March 13.

Sir Robert Grimston (Westbury—C.) said the Urban District Councils' Association felt some uneasiness about the Clause 43, which would abrogate statutory safety provisions which now operated at level crossings over railways and, at the application of the Commission, would enable the present statutory arrangements to be done away with and replaced by Orders made by the Ministry of Transport & Civil Aviation. Many of the present statutory provisions were enshrined in Acts of Parliament of some antiquity. Because of technical progress it was obvious that it would be possible to do away with some of the provisions of the Highways (Railway Crossings) Act of 1839 and of the Act of 1854, and to introduce more modern methods of control—possibly remote control, lights, automatic control, and so on. Local authorities were uneasy because there seemed to be no limitation of the scope and location. What were the Minister's intentions?

Mr. W. M. F. Vane (Westmorland—C.) said they were inclined to insist in these days that the railways continued to spend money on certain works, such as footbridges, and fulfilling certain duties which no longer had very much purpose. The B.T.C. was the largest single industrial organisation in this country, and in spite of its powers had very special difficulties, because the position was not wholly of its own making. Nevertheless, they were entitled to see whether the Commission had done all it could to improve that position, and they should be reluctant to concede these proposals unless they were satisfied that the Commission had done everything possible. We could not afford to have railways other than of the best, but he wondered whether the railways could be made as good as they should be as long as they failed to attract their full share of young men of the highest intelligence and administrative and commercial ability. He did not think they were attracting their full share today. It was greatly to the credit of the railways that they operated as well as they did. That fact showed that there were more people than were perhaps supposed who thought beyond the question of hard cash. This might not continue for much longer. He did not want to see the nationalised industries setting an example in paying what might be called absurd salaries, but he did not think there was any future in offering so little in the way of prospects. Many of the young men considered their prospects on the railways and then passed by and went elsewhere.

"The House," he claimed, "would be doing a good turn to the nation's transport if it encouraged the railways to prune some of their older and less live wood and to set out to recruit a bigger share of the top grade of the young men of the country, who, in the course of time will work their way up."

Mr. Archer Baldwin (Leominster—C.) hoped the experiment which the B.T.C. is conducting with fly-weight diesels and railcars would show that they could be successfully and economically operated on some of those lines which were at present closed, partly closed, or under threat of closure.

Mr. Geoffrey Wilson (Truro—C.) said that even in the case of small crossings on

roads which were little used, there were provisions necessitating a crossing-keeper, double gates, and all sorts of things. No other country would think of insisting on anything of the kind.

Sir Charles Taylor (Eastbourne—C.) referred to Clause 51, under which the section of railway between Lewes and East Grinstead is to be closed. It was closed some years ago by the B.T.C., some of them believed illegally. It was then reopened. It was still open, but under the Bill it was the Commission's intention to close it again. An assurance had been given by Sir Brian Robertson, Chairman of the B.T.C., that the Commission, if granted the powers sought under Clause 51, would not exercise them before submitting the matter again to the South Eastern Area T.U.C.C. On that assurance he and his Sussex friends withdraw objection to the Bill.

Mr. Ernest Davies (Enfield E.—Lab.) said it was a long time since they had had a general debate on B.T.C. affairs. The very large number of proposals in the Bill, as he read them, were made to relieve the Commission of liabilities with which it was no longer necessary to burden it. "We expect the Commission to operate commercially, and we must not prevent it from doing so for merely local reasons," added Mr. Davies.

Mr. G. R. H. Nugent, Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation, said the Commission had a very strong case for closing the Lewes-East Grinstead line. He was quite certain that if they followed the inquiry procedure, local opinion should be satisfied.

The object of Clause 43 was to allow dispensation at selected public road level crossings from the statutory safeguards of the legislation of last century. It also provided safeguards. In practice, the proposed crossing would be visited by an inspecting officer of the railways and a representative of the Ministry's Chief Highways Engineer, with a parallel arrangement in Scotland, and they would always invite the local and the highways authorities to discuss the project on the site with them if they so wished. He believed that those safeguards would ensure that those innovations were only at suitable level crossings. The intention was not to introduce the innovations widely and generally. The intention in the first place was to introduce them experimentally at a few selected places, so that they might have the opportunity of seeing how they worked in this country.

The innovations would be a great help to the Commission as part of its modernisation plan if they turned out satisfactorily. This power would relieve the Commission of the increasingly heavy burden of maintaining and manning all existing crossings of public roads. The cost was increasingly heavy—over £1 million a year on this alone. If the present experiments proved successful and it appeared safe and practical over the next few years to introduce more of those automatic arrangements at crossings, it would undoubtedly be some help in the problem of keeping branch lines going, because the cost of running them would decrease.

The second need was to get the benefit of modern progress by installing this automatic and remote control apparatus where appropriate. The average traffic delay at a level crossing was 3-4 min.; with those devices it was only three-quarters of a minute. Such devices had been very widely used on the Continent in recent years, and in the U.S.A. There were now 700 or 800 of them in France. The only experimental installation in this country had been a lifting barrier in Yorkshire. That was operated from a local signalbox, so it was still hand-worked, and still involved the problem of a man to work it.

Mr. Nugent, in conclusion, said a working party had visited certain countries in Europe in recent months to study their arrangements. It had completed its report, and its publication was being hastened. He hoped it might be possible to get it published in the course of the next month or so.

The Bill was read a Second Time, with a division.

Questions in Parliament

B.T.C. Capital Equipment

Mr. Ian Mikardo (Reading—Lab.), in a written question, asked the Minister of Transport & Civil Aviation on March 5 what was the amount spent in each year since the appointed day on capital equipment in civil aviation, London Transport, railways, and docks and inland waterways, respectively.

Mr. Harold Watkinson gave the following figures for expenditure on fixed assets charged to capital account by the B.T.C. for the years 1948 to 1955:—

Year	British Railways (including C. & D. services)	London Transport	Docks	Inland Waterways
	£m.	£m.	£m.	£m.
1948	33·8	6·8	0·5	0·2
1949	36·7	10·0	0·6	0·1
1950	37·0	11·8	0·6	0·1
1951	40·7	8·1	0·5	0·1
1952	34·7	8·9	0·8	0·1
1953	48·3	6·4	1·1	0·2
1954	60·2	4·3	1·9	0·2
1955	66·8	2·0	2·2	0·2

Rail Link with London Airport

Mr. A. E. Hunter (Feltham—Lab.) asked the Minister of Transport & Civil Aviation on March 20 whether he would give further information on the proposed railway link to London Airport from Central London.

Mr. Harold Watkinson: The B.T.C. and the airline corporations are considering the report of a Working Committee set up to examine this matter. I expect to receive their recommendations in due course.

Postal Facilities at Stations

Mr. Hector Hughes (Aberdeen, N.—Lab.) asked the Postmaster General on March 20 how many, and which, railway stations in Great Britain had no postal, as distinct from telegraph, facilities including the sale of letter cards, stamps, postal orders, and so on, available for travellers and others; why the public were deprived of these facilities; and if he would take steps to rectify these omissions.

Mr. E. Marples replied that the information was not centrally available, but he would gladly look into any particular case.

Mr. Hughes then asked the Postmaster General why the accommodation in Kings Cross railway station could not be used for full postal facilities such as sale of letter cards and postal orders for travellers and other persons.

Mr. Marples replied that contact was being made with the B.T.C. about the possibility of providing facilities of the kind mentioned.

Contracts and Tenders

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. is to be the main contractor for the design and construction of five high-speed diesel-electric all-Pullman de luxe trains, the first of which is expected to enter service on British Railways next year. Two six-car trains will be built for the London Midland Region Manchester-London service and three eight-car trains for Western Region services from Paddington to Bristol, Wolverhampton, and Birmingham. Further details of the trains are given elsewhere in this issue. The traction equipment will be manufactured by the General Electric Co. Ltd. The 1,000-h.p. diesel engines, of which each train will have two, will be supplied by the North British Locomotive Co. Ltd. Auxiliary engines supplying power for air-conditioning, heating, and lighting will be supplied by Rolls-Royce Limited.

The British Transport Commission has placed an order to the value of £290,000 with British Insulated Callender's Cables Limited for the supply and installation of telecommunication cables on the Crewe-Manchester line as part of the modernisation plan.

The British Transport Commission has placed an order with the North British Locomotive Co. Ltd., Springburn, Glasgow, for five 300-h.p. diesel-hydraulic shunting locomotives. These locomotives, which are required in connection with the railway modernisation plan, are for use in the London Midland Region.

USI International, formerly Pressed Steel Car Company, a division of U.S. Industries, Inc., have placed an order with S/A Ateliers de Construction de Familleureux covering 150 30-ton double-bogie wagons for sugar cane.

British Railways, North Eastern Region, have placed the following contracts:—

H. Bingham & Sons Limited, Doncaster: pedestal linings, Doncaster Carriage Works

British Plant Hire, Newcastle-upon-Tyne: demolition of platforms, Ryton Station

Tarslag Limited, Stockton on Tees: road repairs, Newcastle and Darlington districts

Arundel (Contractors) Limited, Bradford: cleaning and painting, Darlington district

La Mont Steam Generator Limited, Wembley: one wood-fired boiler unit, Simonside Wagon Repair Depot

Wadkin Limited, Leicester: one planing and moulding machine, York Carriage Works

Keith Blackman Limited, Leeds: fume extraction plant, York Carriage Works

Heaton & Co. Ltd., Liversedge: heating and boiler plant, Simonside Wagon Repair Depot

Spanner Boilers Limited, Brixton Hill, London: one oil-fired steam boiler, Darlington Loco. Works

Auto-Mower Engineering Co. Ltd., Nr. Bath: rail-mounted trenching machine and "end-on" loading equipment.

British Railways, Eastern Region, have placed the following contracts:—

J. Youngs & Son Ltd., Norwich: Construction of fuelling installation, oil store, messroom, workshop, and stores

at Norwich Diesel Lightweight Train Depot.

Structural Waterproofers Limited, London. W.6: repairs to roof of No. 3 transit shed at Parkeston Quay

Ransomes & Rapier Limited, Ipswich: supply and delivery of five Rapier 7 standard diesel-electric fast travelling mobile cranes.

British Railways, Scottish Region, have placed the following contracts:—

A. & J. Faill Limited, Glasgow: repairs to roads, Chapelhall Goods Station

Taylor & Hubbard Limited, Leicester: provision of five self-propelled diesel-electric rail travelling cranes for installation of overhead line equipment on the Glasgow Suburban electrification scheme.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for four diesel locomotives.

The locomotives are required for haulage of goods wagons inside the Madras Port area. The locomotives will normally be used singly but provision should be made for working the units in tandem and for operation by one crew. The locomotives should be capable of hauling 600 tons at about 5 m.p.h. against a gradient of 1 in 500 over a curve of 400 ft. radius and a maximum speed of about 15 m.p.h. (the hauling capacity at this speed should be specified by the tenderer). Also it shall be suitable for hauling metre gauge rakes with a common rail, in addition to broad gauge rakes. The tenderer shall be prepared to supply if so desired by the Chief Engineer, an additional loco. or two at any alternative terms he may choose to quote.

The issuing authority is the Madras Port Trust. Bids should be sent to the Chief Engineer, Madras Port Trust, Madras. The closing date is April 15, 1957. A copy of the tender documents is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). The reference E.S.B. 6979/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from Pakistan for railway track, as follows:—

20,000 ton medium manganese/carbon steel flatfooted rails, 90 lb. R

1,500 ton medium manganese/carbon steel flatfooted rails, 75 lb. R

2,000 ton medium manganese/carbon steel flatfooted rails, 60 lb. R.

74,722 fish plates for 90 lb. R, equivalent to 713 ton

The issuing authority is the Ministry of Communications, Government of Pakistan. The tender No. is 57/1860/S. Bids should be sent to the Director General Railways, Ministry of Communications, Railway Division, Government of Pakistan, Karachi. The closing date is May 15, 1957. A copy of the tender documents including drawings and specifications is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). The reference ESB/6337/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from Thailand for 1,000 wheel tyres.

Details of the requirements can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1) quoting reference ESB/5819/57.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for pull rods, as follows:—

1,690 pull rods, complete with all fittings for uninterlocked points to EX. B.B. & C.I. Rly. ENC's drg. No. 4472/R-1 (DGS & D. No. 9635) and I.R.S. specification No. M-5-54 (fork ends and adjusting screw to be as per I.R.S. drgs.)

The issuing authority is the Director-General of Supplies and Disposals. The tender No. is SRIA/18990-G/V(B). Bids should be sent to the Director-General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is April 4, 1957. A set of tender documents and drawing, but not specifications, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). The reference E.S.B./6602/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from South Africa for automatic couplers and spares, as follows:—

11,000 automatic couplers "S" type, complete, 8 in. × 6 in., bottom-operated

600 automatic couplers "T" type, complete, 5¼ in. × 4¼ in. × 3 in. shank

450 automatic couplers "H" type, 5 in. × 5 in. shank

2,000 automatic couplers "M" type, complete, 5 in. × 5½ in. shank without strap

29,000 knuckles

300 levers

1,000 locks

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. H.6379 for Automatic Couplers and Spares," should be addressed to the Chairman of the Tender Board, South African Railways, P.O. Box 7784, Johannesburg. The closing date is April 12, 1957. A copy of the tender documents, but not drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). A photo-copy set can be purchased from the Branch for 5s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The drawings may be inspected at the Office of the High Commissioner for the Union of South Africa, Trafalgar Square, London, W.C.2. The reference E.S.B. 6960/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for railway signal brackets, as follows:—

14 two doll bracket signals, lattice type complete with dolls of 12 ft. 6 in. and 9 ft. 6 in. size.

The issuing authority is the Director General of Supplies and Disposals. The tender No. is SRIA/18899-G/V(C). Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is April 9, 1957. A set of tender documents, including drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). The reference E.S.B./6549/57 should be quoted in any correspondence with the branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from South Africa for rail, flange, and checkrail lubricators, as follows:—

170 rail and flange lubricators to suit 96 lb. S.A.R. rails with single or twin greasing plates

110 rail and flange lubricators to suit 81 lb. S.A.R. rails with single or twin greasing plates

100 rail and flange lubricators to suit 61 lb. S.A.R. rails with single or twin greasing plates

15 checkrail lubricators to suit 96 lb. S.A.R. checkrails with single or twin greasing plates

10 checkrail lubricators to suit 81 lb. checkrails with single or twin greasing plates

40 checkrail lubricators to suit 61 lb. S.A.R. checkrails with single or twin greasing plates

complete list of tools required to fit and maintain each lubricator.

complete list of spare parts which can be expected to be used for a period of a year to maintain the number of lubricators of each type and weight of rail in this tender

instructions, manuals, drawings., and information to be furnished with the tender

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. A.6459: Lubricators" should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is April 12, 1957. A copy of the tender documents, including specifications but not drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). A photo-copy set can be purchased from the Branch for 13s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference E.S.B. 6480/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for signal mechanisms as follows:—

100 signal mechanisms lower quadrant single complete with all parts listed on the drg. to IRS drg. No. SA-6189 (adv) alt. nil and to IRS specn. No. 510-56 and as specified on part drgs.

The issuing authority is the Director General of Supplies and Disposals. The tender No. is SRIA/18971-G/V(C). Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is April 18.

A set of tender documents is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). A photo-copy set can be purchased from the Branch for 16s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference E.S.B.7303/57 should be quoted in any correspondence with the Branch.

Notes and News

Train Lighting Foreman Required.—The Nigerian Railway Corporation invites applications for appointment as train lighting foreman. See Official Notices on page 380.

General Manager Required.—Applications are invited for the post of general manager required by the Devon General Omnibus & Touring Co. Ltd. See Official Notices on page 380.

Diesel Assistant to Motive Power Superintendent Required.—Applications are invited for the post of diesel assistant to motive power superintendent required for British Railways, Western Region. See Official Notices on page 380.

Mechanical Engineering Draughtsmen and Technical Assistants Required.—Applications are invited for posts of mechanical engineering draughtsmen and technical assistants required in the railway signal engineer's office at York. See Official Notices on page 380.

Vacancy for Engineering Assistant.—London Transport require an engineering assistant for duties connected with the preparation of schedules covering annual requirements of permanent way material for forward purchasing operations, preparation of manufacturing and delivery schedules for current track renewal operations and liaison with local supplies organisation on day to day technical problems. See Official Notices on page 380.

Peruvian Transport Corporation Limited.—The directors of Peruvian Transport Corporation Limited have stated that with regard to the amount owing by the Bolivian Government up to May 31, 1953, two instalments have so far been paid and they assume that the Government will carry out, in due time, its contractual obligations regarding the payment of the remaining instalments. As to the unconverted boliviano balances arising from international traffic which have accrued over the past few months and prior to the stabilisation loan, discussions are at present taking place with the Bolivian Government. To provide funds for the purchase of six diesel-electric locomotives the operating company has borrowed about $1,500,000 from the Export-Import Bank.

North Eastern Area Board in Hull District.—Mr. T. H. Summerson, Chairman, and members of the North Eastern Area Board, and Mr. H. A. Short, General Manager, and departmental officers of the North Eastern Region, recently visited installations in the Hull area. At various places on their tour they were met by local railway officials.

R.O.D. Officers' Dinner.—The annual dinner of R.O.D. officers was held at the Transportation Club on Friday last. Sir Michael Barrington-Ward presided and among those present were: Messrs. J. Clubley Armstrong, G. B. Barton, F. L. Castle, B. W. C. Cooke, V. R. B. Cooke, T. G. Creighton, F. Horler, R. Horsfield, E. Lake, K. H. Leech, H. G. N. Read, C. E. R. Sherrington, K. R. N. Speir and W. G Tyrrell.

Southern Region Publicity.—New posters from the Southern Region of British Railways include a series of six on characteristic aspects of Britain. Entitled "Our Heritage," these draw attention to specific tourist attractions including castles, country houses, and various sports including cricket, racing and fishing. Each is on the lines of the illustrated example and carries a large line-drawing of a figure connected with the subject advertised, with a small inset picture in colour. New posters include an extension to the "Towns" series and several—one is shown here—for the various South Coast resorts. A number of these have been produced by chromo-litho in up to 12 colours. New literature covers a brochure dealing with Britain as a whole. This contains several attractive coloured and black-and-white photographs in addition to the customary map of the British Isles. Information covers travel arrangements and services from the Continent to Britain, specimen British fares, agencies, and selected excursions. The cover of this brochure, which is in full colour and shows a mounted guardsman in dress uniform against a sketch of the parliamentary buildings, is particularly pleasing. A booklet, the first of its kind, deals in full with the transportation of cars across the Channel and gives very comprehensive information covering every aspect of Continental motoring. It is well illustrated in line and half-tone, and carries three sketch-maps of, respectively, Dover, Boulogne, and Dunkerque embarkation areas.

New Southern Region posters in the "Our Heritage" and "Towns" series

East African Railway Pay Claim Rejected.—East African Railways & Harbours Administration has rejected a claim by the railway African Union for wage increases of 10 to 15 per cent based on an increase in the cost of living.

U.T.A. Costs Increased.—The Ulster Transport Authority announces that the recent increase in the price of petrol, diesel and fuel oil used in the Authority's trains, omnibuses and lorries will cost the Authority an extra £22,000 per year. Added to an increase in poor rates of £22,000 arising out of the revaluation of properties in Northern Ireland, this will make total increased outgoings of £44,000 a year.

Snowbound Trains in the U.S.A.—A report from New York last Monday stated that two long-distance trains, the "City of St. Louis" and the "Golden State," were stranded in 15-ft. snowdrifts in the worst blizzard for 30 years. A doctor reached the "Golden State" on Sunday night in a special snow vehicle, and food was taken to the train by an aircraft fitted with makeshift skis. The doctor was called because some of the 200 passengers were overcome by carbon monoxide poisoning, their coach having been completely buried in snow. All were removed to another coach and were stated to be responding to treatment.

Hadfields Limited.—The group net profits of Hadfields Limited, steel makers and engineers, for the year ended September 29, 1956, were £547,532 against £527,187 for 1954-55, after tax of £787,950 (£707,895). Credit is taken for amounts in respect of previous years of £14,833 (£56,703). After allowing for outside interests of £28,356 and profits of subsidiaries for periods prior to acquisition of £52,368 the profit attributable to the parent company was £481,641. The dividend is raised to 9 per cent (from 7½ per cent, including an interim of 3½ per cent paid prior to the issue of 1,154,393 £1 shares against the acquisition of Millspaugh Limited).

Appointment of Traffic Managers, North Eastern Region.—As recorded in our personal columns last week. Mr. Frank Grundy, Chief Commercial Manager of the North Eastern Region, has been appointed Chief Traffic Manager, North Eastern Region, British Railways, as from April 1; in his new capacity, he will supervise and co-ordinate the traffic functions of the Commercial, Operating, and Motive Power Departments. In turn, Traffic Managers will be appointed for areas, such as Tyneside, Tees-side, the West Riding of Yorkshire, and Hull, to cover the same functions in their own particular areas. The re-organisation, it is announced, will have several advantages: (1) It will enable British Railways to give traders in any particular locality quicker and more authoritative decisions on all matters relating to their traffic; (2) it will

help and encourage local officers by giving them more authority; and (3) by vesting in one post the responsibility for integrating the duties of the Commercial, Operating and Motive Power Departments it will give increased flexibility of working. Not least amongst benefits which will accrue will be the operation of the new freight charges scheme and the development under one unified control of modernisation proposals. It is intended that the new traffic organisation will be introduced in stages, so as to involve the staff in the minimum disturbance, and further appointments will be announced as the scheme develops.

Quick Transport of Large Girder.—The North Eastern Region has received the thanks of Dorman Long (Steel) Limited, of Middlesbrough, for quick transport of a large steel girder from the firm's bridge and constructional works at Middlesbrough to *The Financial Times* building, South Lambeth. In less than 48 hr. from the time that fabrication was finally completed at Middlesbrough the girder was actually on the site, a remarkable feat, bearing in mind that the girder weighed approximately 30 tons.

Beyer Peacock Railway Equipment Limited.—Beyer Peacock & Co. Ltd. has formed a new subsidiary company, Beyer Peacock Railway Equipment Limited, with offices at Locomotive House, Buckingham Gate, London, S.W.1, for the supply of mechanised track maintenance and construction equipment. Beyer Peacock has recently signed a licencee agreement with the Railway Maintenance Corporation of Pittsburgh, U.S.A., to manufacture that firm's equipment in Great Britain. Mr. M. A. Lockhart has been appointed manager of the new company.

B.I.M. to Move London Office.—The headquarters offices of the British Institute of Management and the Institute of Industrial Administration, at present at 8, Hill Street, London, W.1, are to be transferred to specially planned premises at 80, Fetter Lane, E.C.4. The move, which is part of the scheme for re-organisation of the two bodies into one institute, will take place in the latter half of May. The Institute of Personnel Management, an entirely separate body and at present occupying part of the premises in Hill Street, will also take offices in the new "Management House."

North Eastern Region Road Safety Campaign.—A silver cup, given by the Company of Veteran Motorists to the North Eastern Region of British Railways, for annual competition between the districts of the Region in connection with the road safety campaign, has been won for the year 1956 by the Newcastle District Passenger Manager's district. At a ceremony in the York headquarters offices of the Region, Mr. F. Grundy, Chief Commercial Manager, presented the cup to Mr. S. Cott, District Passenger Manager, Newcastle-on-Tyne. The cup is awarded to the district showing the highest percentage decline in the number of blameworthy accidents per vehicle working day.

British Railways Locomen's Quiz Competition.—The British Railways Inter-Regional quiz competition for locomotive men has been won for the second year running by Leeds Holbeck Motive Power Depot, North Eastern Region, who defeated Eastleigh Motive Power Depot, Southern Region, by 60½ to 49 points in the final, held in London on March 21. The Challenge Shield, awarded annually to the winning team, was presented to Fireman H. Spurr, captain of the Leeds team, by Mr. H. P. Barker, part-time Member of the British Transport Commission. Fireman H. Ford of the Eastleigh team was the only contestant to achieve maximum points in the final tie.

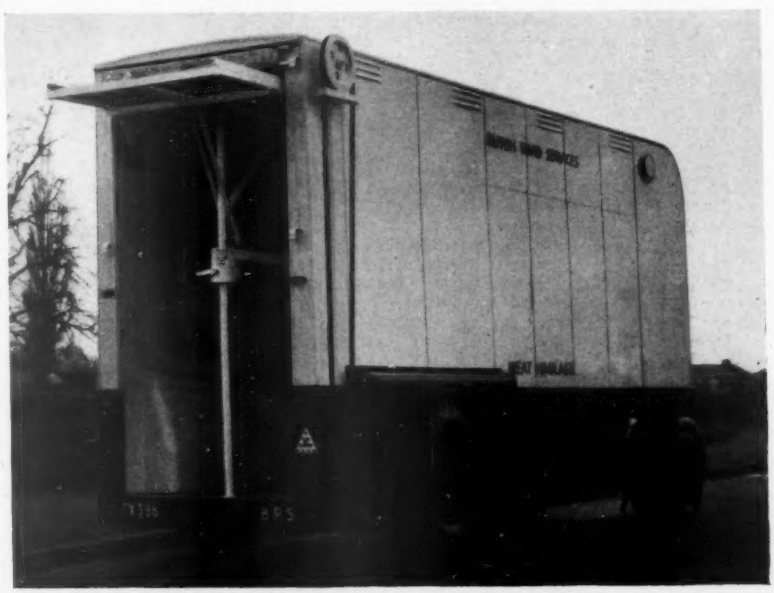
Keith Blackman Stand at British Industries Fair.—Equipment to be displayed by Keith Blackman Limited at this year's British Industries Fair will be, in the main, that which is available from stock. One display will show eight of the types of fan normally in stock and available for quick delivery. A second display will show a cross section of the company's industrial gas equipment, and other exhibits will include a hot blast cupola plant and a shot cleaning unit.

Report of European Conference of Ministers of Transport.—The third report on the activities of the European Conference of Ministers of Transport shows that the Council of Ministers of Transport met twice in 1956, in March in Paris and in October in Munich. The Committee of Deputies held seven regular sessions between October, 1955, and the date of the report (February, 1957) and had a special meeting with the non-governmental organisations concerned on the financial situation of the railways. In the light of additional studies made by the International Union of Railways, the Committee of Deputies has prepared a report for the Council of Ministers which will consider it at its next session : one chapter of this report is devoted to the development of road transport on its own account, and the possible effect this might have on the financial situation of the railways.

Meat Trolley for British Road Services.—The accompanying illustration shows a hang-up meat trolley which has recently gone into service with the B.R.S. (Meat Haulage) Limit fleet. The body is built on a Tasker 8-ton easy-load trailer chassis and is built to carry 24 sides of fresh-killed beef. The sides of beef are raised to roof level by lifting gear incorporated in the body of the vehicle and are then placed on the hooks fitted to roller channels. A separate offal compartment is incorporated at the front.

Westinghouse Brake & Signal Co. Ltd. Issues.—The Westinghouse Brake & Signal Co. Ltd. is to make a rights issue of 1,777,356 ordinary £1 shares on the basis of two new shares for every £3 stock held on April 1. The price of issue will depend upon market conditions when renounceable provisional allotments and application forms for excess shares are posted in the middle of April. It is proposed also to capitalise £2,666,034 of share premium account by the issue to ordinary stock holders of one new ordinary £1 share for every £1 stock held on April 1. The new shares will rank for the full amount of all dividends declared for the year which began on September 30 last.

Improved Steel Capacity.—Speaking at the annual general meeting of the British Iron & Steel Federation in London on March 19, Sir Andrew McCance, President of the Federation, stated that the industry expects that by next year there should be capacity for the production of 24 million ingot tons of steel—twice as much as was being made at the end of the war—and that thereafter demand for steel may continue to rise by at least a million tons a year. With reference to steel plates, he explained that the demand from traditional customers, the shipbuilders, had to be considered with the demand for other important uses such as oil, railway rolling stock and the nuclear energy programme. To supply these needs, six modern plate mills should come into production between now and 1962, raising the annual output of plates by more than a million tons. The industry would have to spend, on average, some £100 million a year on its development programme.



Trolley designed to carry hanging sides of beef recently added to the B.R.S. (Meat Haulage) Limited fleet

Forthcoming Meetings

Open currently and until further notice.—British Transport Commission: Historical Exhibition "Transport Treasures" in Shareholders' Meeting Room, Euston Station, from 10 a.m. to 6 p.m. on weekdays, and 2 to 6 p.m. on Sundays. Admission 6d.

April 5 (*Fri.*).—Institution of Locomotive Engineers, at the Dorchester Hotel, Park Lane, London, W.1., at 12 for 1 p.m. Annual luncheon.

April 5 (*Fri.*).—The Railway Club, at 57 Fetter Lane, London, E.C.4., at 7 p.m. Paper on "Railway history through Acts of Parliament," by Mr. C. R. Clinker.

April 5 (*Fri.*).—Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, 163, Eversholt Street, London, N.W.1., at 7.15 p.m. Paper on "The Sligo, Leitrim & Northern Counties Railway," by Mr. N. W. Sprintos.

April 6 (*Sat.*).—Railway Correspondence & Travel Society, at the Charing Cross Hotel, London. Annual dinner.

April 6 (*Sat.*).—Permanent Way Institution, Leeds & Bradford Section, at 9.45 a.m. Morning visit to "Trumix Concrete" works, Cross Green Lane, Leeds, 9.

April 6 (*Sat.*).—Stephenson Locomotive Society, at 32, Russell Road, Kensington, W.14, at 2.30 p.m. Annual general meeting.

April 9 (*Tue.*).—Institute of Transport, Yorkshire Section, at the Great Northern Hotel, Wellington Street, Leeds, 1, at 6.30 p.m. Annual general meeting followed by film show.

April 9 (*Tue.*).—Railway Correspondence & Travel Society, East Midlands Branch, at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.15 p.m. Mr. W. A. Camwell will present "Cine film shots, 1956—the British Isles and the Cologne area."

April 10 (*Wed.*).—Institution of Railway Signal Engineers, at the Federation of British Industries, 21, Tothill Street, Westminster, S.W.1, at 6 p.m. Annual general meeting.

April 12 (*Fri.*).—Stephenson Locomotive Society, Scottish area, at 25, Charlotte Square, Edinburgh, at 7 p.m. Paper on "Memories of Stewarts Line M.P.D., S.R.," by Mr. R. H. N. Hardy.

April 13 (*Sat.*) to April 14 (*Sun.*).—Stephenson Locomotive Society. Tour of industrial and B.R. locomotive depots, Newport—Cardiff—Hereford.

April 13 (*Sat.*).—Permanent Way Institution, Manchester and Liverpool Section, at Manchester College of Technology, Sackville Street, at 2.30 p.m. Talk on "Earthworks and drainage," by Mr. Lindsay, Research Department, Derby.

April 13 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Norwich, at 2.15 p.m. Paper on "Track renewals on British Railways," by Mr. L. T. Howlett.

April 13 (*Sat.*).—Permanent Way Institution, London Section. Visit to London of Glasgow and North Wales Section members.

April 15 (*Mon.*).—Institution of Electrical Engineers, at Savoy Place, London, W.C.2, at 5.30 p.m. Discussion on "The future of plastics in power cables." Opened by Mr. C. C. Barnes.

April 15 (*Mon.*).—Railway Correspondence & Travel Society, West Midlands Branch, at 64, Holyhead Road, Coventry, at 7.30 p.m. Talk on "Ireland today," by Mr. D. Luscome.

April 18 (*Thu.*).—Diesel Engineers and Users Association. Annual luncheon at the Connaught Rooms, London, W.C.2.

Railway Stock Market

THE rally in stock markets made further progress earlier in the week because of hopes of an early settlement of the shipyard and engineering strikes. Nevertheless a good deal of the better demand has been attributed to continued talk of tax reductions in the Budget, which could result in a substantial advance in stock markets. The main attention centred on industrial shares, and there was an all-round recovery in engineering shares.

Among foreign rails there has been a rally in Antofagasta ordinary stock to 30½, compared with 29½ a week ago, the yield of over 13 per cent on the basis of last year's 4 per cent dividend attracting attention, while the 5 per cent preference stock which yields 10¼ per cent, strengthened from 46 to 46½.

Canadian Pacifics have not kept best levels, but at $64⅞ compared with $62⅛ a week ago, but the 4 per cent preference stock eased from £60½ to £60¼ and the 4 per cent debentures from £70⅞ to £70¼. Elsewhere, White Pass shares have been maintained at $22½, with the debentures at £79½.

Midland of Western Australia stock was again quoted at 8½, and elsewhere, Nyaaland Railways shares firmed up to 12s. 9d. In Indian stocks, the quotation for Barsi remained at 18½.

Vickers were up to 44s. 9d. compared with 39s. 9d. a week ago, Tube Investments rallied to 62s. 6d., Whessoe shares were 33s. 10½d. and Pressed Steel 5s. shares 14s. There was also a better tendency in steel shares, but Steel Company of Wales remained at a discount of 5½d. Firth & John Brown were 28s. 4½d. following the news that Capital Issues Committee consent has been obtained for the rights issue which is to be made on a two-for-five basis. The price of issue is to be announced later.

Beyer Peacock rallied from 43s. to 43s. 9d., Charles Roberts 5s. shares were maintained at 11s. 6d. while elsewhere, Westinghouse Brake shares have been steady at 81s. 3d. on the assumption that the share issue which is to be on a one-for-one basis, will be on generous terms; the price of issue is not to be decided until next month. Consolidated Signal shares kept at 36s. 6d. because shareholders will also be able to participate in the coming Westinghouse issue on the basis of seven Westinghouse shares for every 20 Consolidated 5s. shares.

Birmingham Wagon shares came back to 20s. 4½d., G. D. Peters remained tightly held and quoted at 30s. and Hurst Nelson at 36s. were also the same as a week ago. North British Locomotive at 12s. 9d. were maintained on balance. Wagon Repairs 5s. shares have moved up from 13s. 3d. to 13s. 6d. and Gloucester Wagon 10s. shares at 13s. 9d. were within 3d. of the level ruling a week ago.

Elsewhere, Associated Electrical rose from 61s. 6d. to 63s. 9d. General Electric from 53s. to 56s. 6d. and English Electric were 58s. 3d. with British Insulated Cables 50s. 6d. T. W. Ward were 69s. 3d. and Ruston & Hornsby have strengthened to 32s. 3d. Scottish Machine Tools 4s. shares have changed hands around 6s. and Brush Group 5s. shares around 5s. 3d.

OFFICIAL NOTICES

STRUCTURAL DESIGNERS, DESIGN, DETAIL and LAYOUT DRAUGHTSMEN and CHECKERS are required in our Railway Traction Drawing Office for all aspects of work concerning railway overhead electrification. Experience in this class of work is desirable but not essential, and applicants should have had some structural and/or railway experience. Applicants should write stating age, experience and salary required to the Manager, Overhead Lines Department, Pirelli-General Cable Works Limited, Eastleigh, Hants.

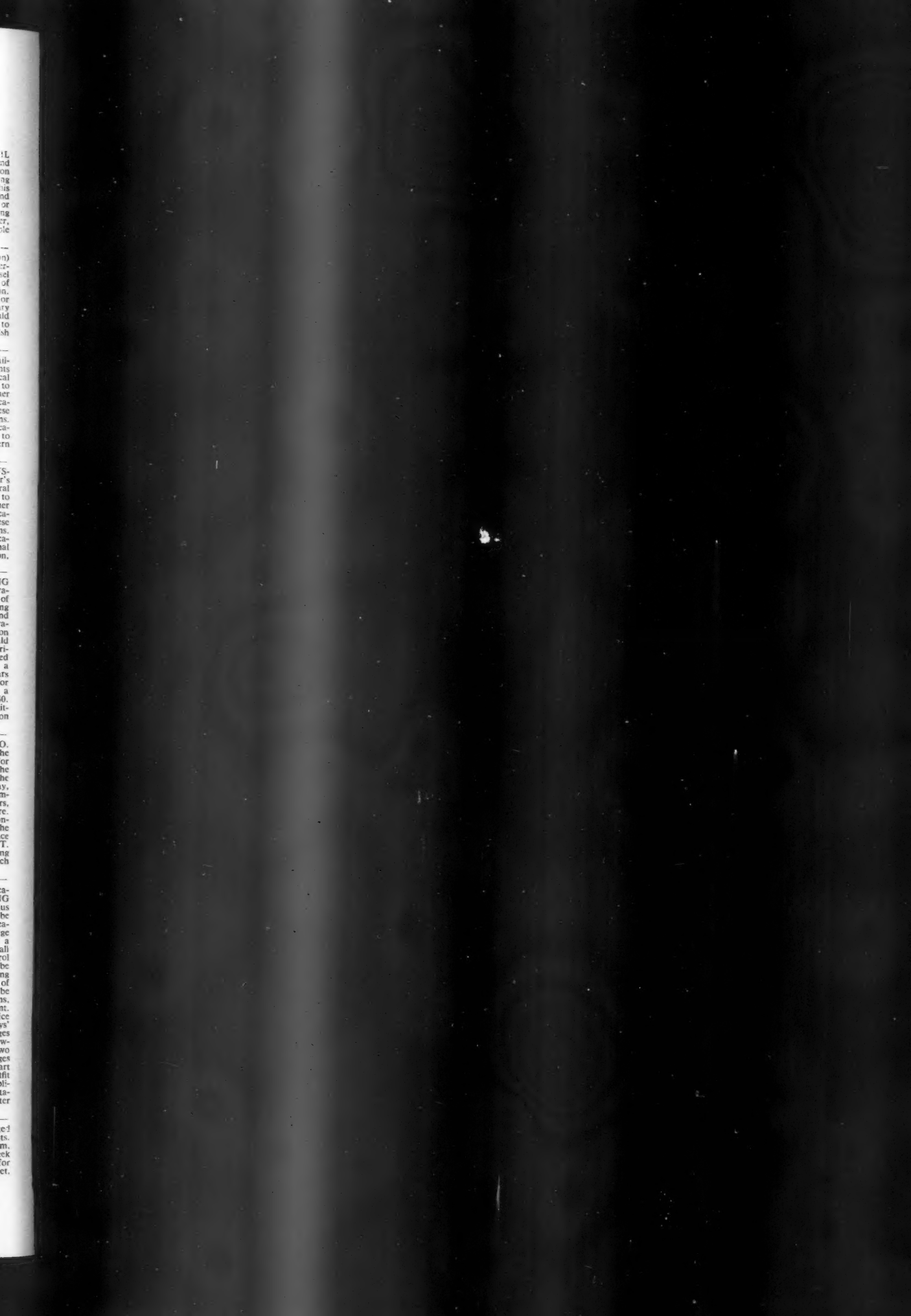
REQUIRED for British Railways (Western Region) DIESEL ASSISTANT to Motive Power Superintendent. Sound knowledge of all types of Diesel Engines suitable for Railway Traction, knowledge of Electric, Hydraulic and Mechanical Transmission. University degree in Mechanical Engineering or A.M.I.M.E. or A.M.I.E.E. an advantage. Salary range: £1,375—£1,585 per annum. Applicants should not be more than 45 years of age. Applications to be sent to Motive Power Superintendent, British Railways (Western Region), Paddington.

TECHNICAL ASSISTANTS required in the Railway Signal Engineer's office at York. Applicants should have good general education and technical training in electrical engineering. Salary rising to £696 p.a. at age 32, with prospects of higher promotion. Applicants holding academic qualifications may receive up to £75 p.a. in excess of these rates. Five-day week and travelling concessions. Applications in writing, giving details of age, education, training, qualifications and experience, to Signal Engineer, British Railways, North Eastern Region, York.

MECHANICAL ENGINEERING DRAUGHTSMEN required in the Railway Signal Engineer's office at York. Applicants should have good general education and technical training. Salary rising to £696 p.a. at age 32, with prospects of higher promotion. Applicants holding academic qualifications may receive up to £75 p.a. in excess of these rates. Five-day week and travelling concessions. Applications in writing, giving details of age, education, training, qualifications and experience, to Signal Engineer, British Railways, North Eastern Region, York.

LONDON TRANSPORT require ENGINEERING ASSISTANT for duties concerned with preparation of schedules covering annual requirements of permanent way material for forward purchasing operations, preparation of manufacturing and delivery schedules for current track renewal operations, and liaison with local supplies organisation on day to day technical problems. Applicants should have drawing office and track maintenance experience, and be familiar with types of materials used in permanent way operations. They must have a good technical education and should give particulars of any studies in progress towards qualifying for either an Engineering degree or membership of a professional Institution. Salary range: £750—£840. Free travel. Applications within 14 days to Recruitment and Training Officer (F/EV 629), London Transport, 55, Broadway, S.W.1.

DEVON GENERAL OMNIBUS & TOURING CO. LTD. GENERAL MANAGERSHIP.—The Devon General Company invites applications for the appointment of GENERAL MANAGER of the Company, which will become vacant shortly. The Company, whose headquarters are at Torquay, operates over 300 vehicles, and its operations, comprising stage carriage services, excursions and tours, extend over a wide area of South East Devonshire. Applications (which will be treated in strict confidence) should set out in chronological order the candidate's age, history, qualifications and experience (in detail). They should be addressed to Mr. W. T. James, Chairman, Devon General Omnibus & Touring Co. Ltd., Stratton House, Piccadilly, W.1, to reach him not later than 12th April, 1957.

THE Nigerian Railway Corporation invites applications for appointment as TRAIN LIGHTING FOREMAN. Salary £700×£50—£1,200 p.a., plus £300 p.a. overseas pay. Commencing salary will be according to qualifications and experience. Qualifications: Candidates must be capable of taking charge of the staff and all Train Lighting matters in a District, including maintenance and repair of all coach electric equipment, dynamos, batteries, control gear, water raising apparatus, etc., and will be expected to train staff in all related matters, including armature winding and other repairs. A knowledge of diesel and petrol engines and refrigerators would be an advantage. Appointments on pensionable terms, or on contract carrying a gratuity of 20 per cent. of total emoluments per annum. Terms of service provide for tours of 15 months each, seven days' full pay leave per month of service, free passages for officer and wife, and separate domicile allowance £75 p.a. each in respect of maximum of two children while in U.K., or cost of their passages to and from Nigeria, if only 18 years of age. Part furnished quarters provided at low rental. Outfit allowance £60, payable on first appointment. Applications to be addressed to The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

LA VIE DU RAIL—a unique weekly illustrated magazine with many full colour supplements. Articles on railway progress and history, tourism, etc. First-class information from France every week of the year for only 32s. p.a., or send 1s. for specimen copy. Contours, Ltd., 72, Newman Street, London, W.1.